

PERSONALITIES

By George F. Taubeneck

Man About Towns

HOWARD RICHARDSON, assistant to Powell Crosley, Jr., says that a war in Ethiopia should boom the sale and use of late-model radio sets.

Now that short-wave broadcasting and reception have made it possible, perhaps it is not too much to expect the next war to be broadcast round-by-round and play-by-play.

If Henry Ford could obtain the sponsorship rights for that thriller, he should have something which might even match his broadcast of the World Series for sustained interest.

Be that as it may, there is truth in the assertion that short-wave radio is doing a great deal to make Americans into Citizens of the World.

Getting down to this industry, ELECTRIC REFRIGERATION NEWS has noticed a surprising pick-up recently in its foreign subscriptions (entirely unsolicited). We have also been receiving an extraordinary number of visitors from abroad. Questions about export conditions have been baffling us in greater number, too.

Anyway, the News has decided that something should be done about it. And so the editor of this yere paper has accepted the exceedingly tough assignment of making a World Survey of Markets for Electrical Appliances and Air-Conditioning Equipment (yep, nice work—if you can get it to do!).

Exact dates of our departure and details of the itinerary we hope to have ready for reporting in the next issue of the News. Roughly, we plan to leave in a few weeks for the Pacific Coast, spend a short time out there, and then embark for Australia—stopping at the Hawaiian Islands en route.

Other stops tentatively scheduled include the Dutch East Indies, India, Egypt, Greece, Italy, France, Austria, Poland, Russia, Norway, Sweden, Germany, Switzerland, and England.

Editorial material and photographs will be mailed back to ELECTRIC REFRIGERATION NEWS from every point, and we hope to give readers a fairly complete picture of what's going on in refrigeration, air conditioning, and appliance fields all over the globe.

Our series of delineations of cities (sometimes called "An Editor on Wheels," or "Man About Towns") will thus get some colorful additions.

More about this projected trip next week.

Fife and Drum

Frank Pierce, who directs one of the greatest specialty selling organizations ever recruited, trained, and regimented—that of Frigidaires electric refrigerators—recalls hearing old-timers (such as "Mickey" Farrell) tell about a sure-fire stunt always used to elicit John Patterson's approval.

If there was a new product to be introduced, a new advertising theme, a novel sales campaign plan, or a bright idea for a contest, the product, theme, or plan was first envisaged on posters or pyramid charts, put on wheels, and then carted down the center aisle of a meeting or convention behind a fife and drum corps.

The stirring martial rhythms never failed to stir Mr. Patterson into excited enthusiasm.

Pyramid Charts

If the pyramid chart invented by John Patterson hasn't been given due attention before, it should be mentioned right here and now.

This chart consisted of a whopping big pad of paper (generally around 3x5 feet) suspended from an easel which took the form of an elongated wooden pyramid.

One was placed in every executive's office. Thereon, in large crayon script, the executive wrote reminders of things to be done, outlines of plans being worked on, and analyses of current sales procedures.

Patterson used one to explain every idea he had. Each speaker in a convention or sales meeting wrote on such a chart as he talked, so that his hearers could see his fundamental points.

Today the pyramid chart is in use in a thousand offices. Its invention was an important "birth" in the development of the specialty selling technique.

Wrecking Crew

One activity sponsored by John Patterson which is seldom talked about except *sotto voce*—and which by no means is recommended as an approved specialty selling practice—was his "wrecking crew."

Old John didn't like competitors or competition. It was his policy to keep competing machines from being used. If one did happen to be sold to an unsuspecting retailer, Patterson sent the "wrecking crew" out to put this machine out of commission.

One gentleman who was a member of that "wrecking crew" (we shall naturally respect his desire to keep his identity hidden) has told us an anecdote of one of the milder "wrecking" jobs which will serve to suggest the methods frequently followed by the "crew."

Mr. X learned about the installation of a competitive make of cash register in a drug store in a small Indiana city. So he packed his bag, traveled thither, and registered at the leading hotel.

The evening of his arrival he located the drug store, and dropped in for cigars. Next evening he followed suit, and the next and the next. On the fifth evening he casually engaged the proprietor—who by this time had come to recognize Mr. X and look for his regular evening stop for cigars—in conversation.

"Yes," he told the druggist, "I just

Tables Turned



Fred Hulburd of Kelvinator's sales promotion department (and director of the crack Kelvinator orchestra) turns the tables on George Wilcock of the Metropolitan Motion Picture Studios by getting a few photos of this purveyor of business promotion talking pictures.

dropped into this city for awhile to get a rest. Been working too hard, and the strain was getting me. Don't know a soul here, and I'm finding

peace and relaxation in a highly satisfactory manner."

"What business are you in?" inquired the apothecary presently.

"Why, I'm with the National Cash Register Co.," replied Mr. X.

"Hm-m-m-m," mused the druggist, almost regretfully. "You're the first one of them fellers I've liked. A whole passel of 'em has trooped through here, trying to sell me. I didn't like the way they went about it, and that's why I bought that Blank machine you see over there. What do you do with that company?"

Mr. X lit a fresh cigar, managed to look a bit tired and worn, and responded, at length:

"My job is to help customers with their business. Primarily, I'm a store layout man."

"Zat so?" inquired the druggist rhetorically. "See anything green about the layout around here?"

Again Mr. X paused, looked tired, and drew out the fragrance of the cigar before answering:

"Well, in the first place, I wouldn't have that cash register up here in front. I'd put it in the back of the store. Then your customers would have to walk back there to get their change. In so doing, they'd have to pass by some of your table and

Still Living



No, Carl Snyder, dishwasher sales manager for General Electric, does not have a lily in his hand, as the above snapshot would seem to indicate. He's very much alive and kicking, and is helping his branch of the industry establish a new sales record this year.

counter displays, and might see something else they'd want."

Instantly the druggist's face lighted up.

"Why, that's a first-rate idea," he enthused. "What do you say we move it back right now?"

The "wrecker" agreed, and the two of them picked up the Blank cash register and started to carry it to the back part of the store. Then accidentally—oh, so accidentally—the "wrecker" stumbled, and the cash register crashed to the floor. It was a "wreck" all right.

Mr. X put on a good act of being mortified and humiliated almost beyond words. Finally he said:

"Well, I haven't got the money to pay you for your machine now. But I'll tell you what: I can get a National Cash Register sent out from the factory, and pay them for it when I'm able."

Next day a shiny new National cash register arrived at the drug store, and began its job of collecting and recording deposits of small change.

The Dayton Flood

The Dayton flood, which occurred in March, 1913, brought John Patterson to the attention of the entire nation—and probably saved him from federal prosecution for "practices in restraint of trade." Aware ahead of time of the dangers lying in the shallow, wide basin of the Miami, and the low, flat banks along the river should too much rain fall, he was especially alert during this month of March, while others went along oblivious to signals of the impending disaster.

Prelude to an Idea



Readers who have noticed the pictures on page 1 may begin to believe that this is the Art Scaife Issue of Electric Refrigeration News. But we simply can't resist printing this in-character picture of General Electric's appliance sales promotion manager convoluting that fertile gray matter of his. No doubt, he's concocting a new idea for getting across the "40% less current" theme without incurring the retaliatory wrath of rival advertising campaign planners.

Early on the morning of the 25th, he climbed up to the roof of his factory, and looked out over the Miami Valley. Seeing that the flood was coming—and that it would be a humdinger—he did what he could to meet the crisis.

He had the factory halls cleared to make room for beds; he brought in blankets and carloads of bread.

And, most interesting of all, the machinery in the plant stopped making cash registers and began turning out wooden boats—flat-bottomed scows, each of which was propelled by a long pole—that later were to save hundreds of people from the submerging of the streets. Patterson got his production line tuned to the point where a scow came off the end every six and one-half minutes!

Then the flood came, and all day long Mr. Patterson stood in his hip boots, directing the progress of his rescue crew, and sending on to the factory all the homeless and cold. The governor of the state (James Cox—later a Democratic nominee for President) named Patterson chairman of a committee of five to run the city, and for several weeks he was practically city manager. His organizing and executive abilities were never seen to better advantage, and overnight he became a national hero.

The NCR Derby

One of Patterson's best and most popular contests was known as the "Derby." This contest was conducted on a plan similar to that of a horse race. Each branch was designated as a certain racing horse. Branches having approximately the same sales quotas competed against each other in "track" groups, each group of racers being burdened with like "handicaps," or sales quotas for the drive.

Salesmen assumed the role of jockeys, and received tickets for each cash register they sold during the campaign.

At the close of the race the derby purse was divided among the various track groups on a percentage basis, after the total sales figures rung up during the drive had been tabulated by official checkers. Three winners having the highest sales records for the contest, were chosen from each "field."

This "derby" contest has been emulated by many sales organizations in the specialty selling field in the last two decades, including Kelvinator Corp.

Field Goals

A football contest was another winner, and helped branches make "field goals" (territorial quotas) during fall months.

Branches were matched against branches, and salesmen against salesmen on a percentage of quota basis.

Games were played each Saturday on a count of the week's sales. Opponents were named each week on a definite pre-determined schedule, just as in regular college or professional ball.

The eleven retail salesmen making the greatest yardage during the series won places on the "All-American" team.

A scale of "yards gained" was established for the sale of each size of register. A total of 100 yards, of course, was equivalent to a touchdown. In addition to regular commissions, a bonus was paid each salesman on each register sold after he had made his first touchdown.

The grand prizes for members of the "All-American" teams were trips to some prominent football game.

Blue Chip Game

Another sales contest which has proved popular and been widely emulated is the "poker" contest (Stewart-Warner used it this year).

For each of the first two cash registers sold during the contest, the salesman received two cards; for each additional register sold thereafter during the contest, he received one card. (A "card" was a bona fide playing card, selected at random from a regulation deck).

Any possibility of trading in cards was precluded by writing the salesman's name across the card in indelible ink and mailing it to him in a sealed envelope.

At close of the contest, players made up their best five-card poker hands and submitted them for jackpot first prize. Prizes were awarded in each of the sales territories. Additional merchandise prizes were awarded on basis of total number of cards earned.

Stepping Up Receipts

Helping customers with their business was no idle purpose of Patterson's sales representatives. This quotation from an N.C.R. retailer's manual shows the practical and useful nature of the advice they offered:

- "Sell larger quantity.
- "Sell better quality.
- "Sell articles that are used together.
- "Feature group prices for two or more of the same article.
- "Call attention to new goods.
- "When an article or brand asked for is not in stock, sell something that will take its place.
- "Offer to get anything a customer asks for that is not carried.
- "Display related goods close together so customers will be reminded of needs and salespeople can suggest things easily.
- "Put near the cash registers and on wrapping counters goods most often sold by suggestion."

Apex's Mr. Strittmatter Is High-Pressured by His Lieutenants—But Comes Out Smiling



(1) Charles W. Smith and W. M. De Witt, salesmanager and refrigeration sales manager, respectively, of Apex Rotarex Corp., attempt to sell their chief—R. J. Strittmatter, vice president in charge of sales—on an idea. (2) They listen while Mr. Strittmatter points out a few flaws, which hadn't been obvious at first glance, in the idea. (3) "Now if I were doing it," continues Mr. Strittmatter, "I'd begin by emphasizing our few-service-calls field record." (4) "I had 'em that time," he grins, as his two associates depart to revise the plan.

REFRIGERATION NEWS

Registered U. S. Patent Office

ESTABLISHED 1926. MEMBER AUDIT BUREAU OF CIRCULATIONS. MEMBER ASSOCIATED BUSINESS PAPERS.

VOL. 16, No. 6, SERIAL NO. 342
ISSUED EVERY WEDNESDAY

Entered as second-class
matter Aug. 1, 1927

DETROIT, MICHIGAN, OCTOBER 9, 1935

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Business News Pub. Co.

THREE DOLLARS PER YEAR
TEN CENTS PER COPY

Debate Features A.S.R.E. Winter Meeting Plans

Technical & General Aspect Of Air Conditioning To Be Considered

NEW YORK CITY—Thirty-first annual meeting of the American Society of Refrigerating Engineers will be held Dec. 4, 5, and 6 at Hotel Pennsylvania here.

Features of the meeting will be a technical program, concerned, in the main, with air conditioning, and a debate on the subject, "Should Engineering Be a Closed Profession?", in which members of Polytechnic Institute of Brooklyn and Stevens Institute of Technology will participate.

The "engineers' debate," as it is being called, will be held during the evening session of the first day, Dec. 4. Competition is now under way at the two participating schools to choose the teams who will compete. The event will be broadcast, and \$300 in prize money will be awarded the better team and the best individual speaker.

Object of the debate, says Harry Harrison, president of the A.S.R.E., is to encourage the development of private research among the contending students, and to clarify, by free discussion, a much-disputed question in engineering circles today. Sides will be chosen by lot, two weeks before the debate.

The tentative program for the meeting is as follows:

Wednesday, Dec. 4, 10 a.m. First Session: (Salle Moderne, on roof). Topic, Technical Aspects of Air Conditioning. Chairman: Harry Harrison, president, A.S.R.E.

"Data from Experiment & Research Preceding the Construction of Large Freon Compressors," Llewellyn Williams, engineer in chief, York Ice Machinery Corp., York, Pa.

"The Calculation of Evaporator Surfaces for Air Conditioning," F. H. Faust, General Electric Co., Schenectady, N. Y.

12:30 p. m. Second Session: Topic, General Aspects of Air Conditioning. Chairman: Dr. A. R. Stevenson, past president, A.S.R.E.

"Investigations of the Health Aspect of Air Conditioning," Dr. W. J. McConnell, Industrial Health Section, Metropolitan Life Insurance Co., New York.

"The Control of Odors," Philip Drinker, Harvard School of Public Health, Boston.

"Safety in Air Conditioning," Dr. C. S. Cragoe, senior physicist, Bureau of Standards, Washington, D. C.

Sound film—"Industrial Noise Control."

8:30 p. m. Smoker (ball room, mezzanine floor).

Debate (to be broadcast): Question: Resolved, That Engineering Should (Concluded on Page 17, Column 4)

Gibson Appoints New York City Distributor

NEW YORK CITY—Metropolitan Electrical Distributors, 50 W. 17th St. here, has just signed to distribute Gibson household electric refrigerators, reports Frank S. Gibson, Jr., New York representative of Gibson Electric Refrigerator Corp.

Robert L. Simon is president of Metropolitan Electrical Distributors.

Engineers Adopt New Rating & Test Codes

NEW YORK CITY—Tentative adoption of two new rating and testing codes, one covering condensing units, the other air conditioning, marked the annual meeting of the Council of American Society of Refrigerating Engineers here Sept. 26.

The codes, presented by Louis S. Morse for the committee of which Glenn Muffly is chairman, are the work of a joint committee composed of members of A.S.R.E., National Electrical Manufacturers Association, Refrigerating Machinery Association, Air Conditioner Manufacturers Association, and American Society of Heating and Ventilating Engineers.

Presentation of the codes for final adoption will be made at the annual A.S.R.E. meeting here Dec. 4, 5, and 6.

Indiana Finance Act Unconstitutional

SOUTH BEND, Ind.—The Indiana Retail Instalment Sales Act, which attempted to control finance company rates and the operations of finance companies, automobile dealers, and dealers in other commodities sold on instalment credit, was declared unconstitutional last week, by unanimous decision of a three-judge constitutional court.

The decision was handed down in an injunction suit brought by General Motors Acceptance Corp. and a South Bend Chevrolet dealer, attacking the constitutionality of the law. The court consisted of Federal Circuit Judge George T. Page, Chicago; and Federal District Judge Thomas W. Slick, South Bend; and Patrick T. Stone, Madison, Wis.

In its ruling, the court held the statute void in its entirety. The act undertook not only to regulate rates, which, the plaintiffs asserted, constituted illegal price-fixing, but also to control competitive situations between finance companies themselves.

New Machine Pressures Adopted for Detroit

DETROIT—A new table of allowable pressures on refrigeration systems for various refrigerants has been issued by H. H. Mills, chief safety engineer, Bureau of Safety Engineering, City of Detroit.

The table of allowable pressures is as follows:

Refrigerant	Lbs.
Ammonia	300
Carbon Dioxide	1400
Dichlorodifluoromethane (Freon F-12)	200
Dichlorotetrafluoroethane (F114)	70
Ethyl Chloride	100
Methyl Chloride	180
Methylene Chloride (Carrene No. 1)	50
Monofluorotrichloromethane (F11)	50
Sulphur Dioxide	135

Relief valves on systems containing the above refrigerants shall be set accordingly and the set pressure permanently stamped on the body of the valve.

For refrigerants not covered in the above table, the minimum test pressure for the high side shall not be less than the vapor pressure of the refrigerant at 135° F. For the low side, the test pressure shall be not less than the vapor pressure at 110° F.

Motors, Controls in Spotlight This Issue

In the spotlight of special editorial attention this week are motors and controls for electric refrigeration systems.

Starting on page 14 and continuing through the next four pages are articles dealing with the proper care and servicing of motors designed for refrigeration work.

The section on controls begins on page 18 and continues through page 22. Both household and commercial controls are covered in the articles which deal with design, operation, and adjustment of these devices.

Refrigerator cabinets, and cabinet parts and finishes will be featured in a special section of next week's issue of ELECTRIC REFRIGERATION NEWS.

Square D Introduces Controls for Use On Commercials

DETROIT—The Square D Co. is entering the refrigeration controls field with a line of pressure and temperature controls, featuring overload protection, for commercial refrigeration equipment. The line of refrigeration controls is being built and marketed by the Regulator Division of the Square D Co. with offices and factory here.

Development of the refrigeration control line follows a related line of pressure, float, and vacuum controllers produced by Square D for the air compressor and water pump industry.

Big features of the line are two devices: one a regulator which incorporates a low pressure (or temperature) control, high pressure cut-out, and motor overload all in one compact control; and the other "unified" control for large compressors, consisting of a proper motor starter and the necessary automatic temperature or pressure control, housed and wired in one steel enclosure.

The overload assembly for the Square D refrigeration controls is a compact, self-contained unit, adaptable to all regulator types. The overload device is of the melting alloy type, employing a solder pot and heater coil.

A variety of separate, removable heater coils is available in sizes to meet motor current requirements up to the regulator electrical ratings, which are a.c. single phase 110-220 volts, 1 hp.; d.c., 115-230 volts, ½ hp.; pilot duty, 550 volts, a.c., 5 amps.

A novel wiring scheme for 110-220 volts, double voltage, single phase a.c. motors is shown on the instruction card that accompanies all regulators. The same size heater coil can be used at either voltage with a change of the motor connections. With a motor of this type, the heater coil can be selected for the full load current at 220 volts and the regulator may then be wired without a change of coil at either voltage by following the card instructions.

In addition to overload protection, this portion of the switch affords (Concluded on Page 21, Column 3)

Rhode Island Show Opens

PROVIDENCE, R. I.—The Electrical League of Rhode Island, with headquarters here, is holding an Electrical Radio Exposition this week, the show closing Oct. 12.

'Zeke' Carrithers Joins Staff of The News

DETROIT—R. T. Carrithers of Toledo, O., has joined the advertising department of Business News Pub. Co. as special representative and will be available to assist manufacturers in working out sales campaigns directed to the refrigeration trade.

Mr. Carrithers was for ten years a member of the advertising agency firm of Charles F. Dowd, Inc., Toledo, and has also been connected with the Lord & Thomas agency in Chicago and the Geyer Co. at Dayton.

During the past four years Mr. Carrithers has had a variety of experience in both the household and commercial branches of the electric refrigeration industry with General Electric and Westinghouse distributors, including N. K. Ovalle Co., Harrisburg, Pa., H. G. Bogart Co., Toledo and J. W. Greene Co., Toledo.

His experience covers sales promotion as well as retail and wholesale selling in the field. He holds certificates for having successfully completed the G-E courses of study in retail, commercial and apartment house selling. Just prior to joining the News staff he was Westinghouse refrigerator and Atwater Kent radio dealer supervisor in the northwestern Ohio territory.

G-E Shifts Personnel In Conditioner Dept.

BLOOMFIELD, N. J. — Several changes in departmental operations have been announced by J. J. Donovan, manager of the air-conditioning department, General Electric Co., in conjunction with the recent consolidation of all divisions of the department here.

E. J. Opal, formerly manager of the merchandising division, has been appointed manager of the gas furnace and air circulator division, to devote his full time to the marketing of those products.

The merchandising division has been discontinued, and E. B. Shiddell, its former assistant manager, has been appointed assistant to the manager of the air-conditioning department, in charge of dealer operations.

A. C. Roy, advertising and sales promotion manager, will also serve as chairman of the sales committee. R. U. Berry has been placed in charge of special applications. H. E. Perkins, manager of the Bloomfield works, has been appointed a member of the product committee and chairman of the manufacturing committee.

The consolidation of the department, started in July when divisions of the company in New York and other eastern cities were moved to Bloomfield, was recently completed when 50 additional members of the department were transferred to the New Jersey plant from the General Electric headquarters in Schenectady.

Georgia Power Adds 8,511 Units to Lines in 8 Mos.

ATLANTA—Household electric refrigerators added to the Georgia Power Co. lines, including rentals and sales, during the first eight months of 1935 totaled 8,511, an increase of 462 over the 8,049 added during the first eight months of last year.

Utilities Asked To Stop Home Demonstrations

Association of Wisconsin Dealers Seeks to End Practice

MILWAUKEE — The Wisconsin Radio, Refrigeration, and Appliance Association, in a letter to merchandising managers of the state's public utility companies, will ask that the latter discontinue the practice of putting out electric refrigerators on home demonstrations, to preserve the present friendly relations between dealers and utilities in Wisconsin.

This decision followed a discussion of a report on utilities' trade practices in regard to home demonstrations, made at the September meeting of the association. At present the practice does not concern Milwaukee, but is understood to be quite prevalent in cities outside the Milwaukee trade area, particularly in the larger towns up-state.

While some utilities had been making a practice of putting out chest-type models on home demonstration, to promote a greater use of electric current in lower-income homes, it was reported that others were extending this policy to any model of refrigerator desired.

General consensus of opinion was that the utilities' practice, if continued, would prove detrimental to retail dealers.

It was recalled that in some western cities, where similar demonstrations through utilities were conducted, relations with retail dealers had become estranged.

To prevent a similar situation from arising in this state, it was decided to call the attention of utility companies to this matter, and request that they discontinue their present home demonstration policy, especially as it applies to all except chest models.

The association has received the support of six other retail trade groups in its campaign to discourage group buying by or for employees of Milwaukee industrial plants. The movement is being centered through the Milwaukee Association of Commerce, and a letter will shortly be sent to executives of leading industrial concerns, asking their cooperation in stopping the practice.

Philadelphia Dealers Open Eighth Show

PHILADELPHIA—Eighth annual Electric and Radio Show, sponsored by the Electrical Association of Philadelphia, opened its doors Monday for an all-week stand in giant Convention Hall here. The exposition, oldest show of its kind in the United States, will close Saturday night.

Hundreds of electrical products, including refrigerators, radios, ranges, washers, irons, and air-conditioning equipment, will be on display throughout the exposition, in which manufacturers, distributors, retailers, and utility companies are cooperating.

Last year's show attracted 115,372 people, and exhibitors are confident that the exposition will continue its seven-year habit of always beating the preceding year's attendance mark. George R. Conover is managing director.

Lewis Crosley Meditates and Smiles as He Reads Editorial in the News



(1) A. G. Lindsay, Crosley foreign division manager, just back from a Mediterranean trip, spellbinds Publicityman Jim Beckman and Assistant to the President H. E. Richardson with inside stories of the Italo-Ethiopian dispute. (2) Vice President Lewis Crosley reads "Profits from Glamour," the editorial in the Sept. 25 News on fall radio prospects. (3) "You're going to see radio sales mount next year. The new metal tube development will boom the replacement market." (4) Mr. Crosley smiles as he visualizes the difficulty of "getting dramatic over a pair of sox."

Figure in Delco Personnel Shift



In a recent shift of personnel by Delco Products Corp., E. D. Madden (left) was made assistant to John B. Estabrook, president of the Sunlight Electrical Division of the company; J. N. Tilbrook (center) was appointed assistant to R. L. Wilkinson, general sales manager; and R. O. Yost (right) became service manager.

New Utah Power Rates Affect Refrigeration

SALT LAKE CITY—New rate schedules, effective on billings based on meter readings taken after Oct. 1, have been filed with the public service commissions of Utah and Idaho by Utah Power & Light Co.

The schedules provide for lower rates for increased consumption of electricity, and apply to the company's interconnected system in Utah and Idaho. The plan is also available for customers of the Bountiful Power & Light Co. in Bountiful, Centerville, and Woods Cross.

Under the new rates, customers get a 50 per cent reduction for all current used in excess of that used during the corresponding month in the year ended in June, 1935. For example, if a customer who used 30 kwh. in October of last year uses 40 kwh. this October, the additional 10 hours would cost him but 3½ or 4 cents each, instead of 7 or 8 cents each, the former rate.

The company has also changed the residential lighting schedule by lowering the rate to 4 cents per kwh. after the use of 86 kwh. in any month. Heretofore, the rate was a straight 7 or 8 cents per hour after the 90 cents or \$1 charge for the first 11 kwh.

Now, the customer will pay 90 cents

for the first 11 kwh. (\$1 in small towns and rural areas), 7 cents per hour for the next 75 hours (8 cents in small towns), and 4 cents per hour for all additional current.

Included in the schedule is a change in the residential refrigeration rate, which provides all kilowatt hours above the included energy for the room charge, and the 76 kwh. at 4½ cents per kwh. will be 4 cents per kwh. In the past, all energy above that included with the room charge was straight 4½ cents per kwh.

Howatt Addresses Detroit A. S. H. V. E. Meeting

DETROIT—John Howatt of Chicago, national president of the American Society of Heating and Ventilating Engineers, was scheduled to speak on "This Changing World," dealing with the effect of air conditioning on the modern mode of living and business conditions, at the meeting of the Michigan chapter of the organization Tuesday night, Oct. 8.

Chestnut Made Director Of McCord

DETROIT—Charles O. Chestnut, treasurer of McCord Radiator & Mfg. Co., has been elected a director of the company.

G-E Contest Sales Show Gain over '34

CLEVELAND—Sales in the \$100,000 "Stock Market" campaign in which General Electric distributors are participating are running 35 per cent ahead of sales made during a comparable campaign period last fall, according to reports for the first three weeks of the campaign received by the Specialty Appliance Sales Department here.

The contest opened Sept. 16 and closes Nov. 9.

Leading all other distributors at this stage of the campaign is the George Belsey Co., Ltd., Los Angeles distributor.

A novel method is being employed to distribute the \$100,000 in cash prizes. Salesmen are issued shares of stock on the "Refrigerania Stock Exchange" at the rate of one share for each \$100 in sales. Each week they receive engraved certificates covering the shares earned during the seven-day period. Stock values fluctuate much as they do on the New York Exchange, depending upon weekly quota realization of the particular distributorship and the sales department under which the salesman operates.

At the end of the campaign, all stock certificates will be redeemed for cash, the amount per share being determined by the final quota realization. Thus, by exceeding their quota, salesmen in a given department may realize proportionately more per share; whereas, if the department or distributor falls behind quota, the cash redemption price of each share of stock is reduced in proportion.

Standings of the national leaders to date:

Name	Per Cent of Quota
1. George Belsey, Ltd.	67.5%
2. Southern Appliances	64.7%
3. George Patterson, Inc.	62.7%
4. Electrical Appliances, Indianapolis	61.5%
5. W. L. Thompson, Inc.	60.8%
6. Matthews Electric	60.0%
7. Electrical Household Appliances, Dallas	53.8%
8. Tennessee Appliances	52.8%
9. Valley Electric	49.8%
10. Electrical Appliances, San Francisco	49.5%

Ice Industry Plans to Spend \$3,000,000 in Advertising in 1936

DETROIT—Ice and ice refrigerator manufacturers are planning to spend approximately \$3,000,000 in national and nation-wide tie-up advertising in 1936.

Of this amount, approximately \$500,000 will be spent in magazines of national circulation and radio programs, and the remainder in ice company tie-ins and collateral advertising.

The national program will serve as a background for local or unit advertising, including refrigerator manufacturers' sales helps, which will go direct to the consumer with the name and address of the local ice dealer.

Selection of advertising counsel, approval of copy and media, and all other problems of the national campaign will be handled by a committee selected from the 10 divisions of the country.

Working with this group is a committee of three, selected by ice refrigerator manufacturers, and composed of W. L. Arndt, Coolerator Co., Duluth, Minn.; R. T. Frazier, Tennessee Furniture Corp., Nashville, Tenn.; and W. H. Cloud, Progress Refrigerator Co., Louisville, Ky.

Ice Refrigeration Bureau, with headquarters here, will make available a complete local advertising and educational campaign, which will be offered to all ice companies on a basis permitting them to buy as much or little as they can use to advantage. The bureau is a non-profit cooperative undertaking.

I. R. B. is composed of representatives from each unit ice association cooperating in the campaign, and is the outgrowth of several of the most successful unit advertising undertakings within the industry for the past three or four years.

Purpose of the bureau is to provide local advertising material on a basis of reduced cost to the user, but companies or units may make up their own material if they wish. Offices of the Bureau are in the Book building here. Ben T. Steers, secretary of the Michigan association, is chairman, and N. F. Lawler is director.

Advertising material devised by the bureau will be offered through unit association offices. In sections where this procedure is not followed, any ice company may purchase the I.R.B. material direct from headquarters here.

Importance of the campaign, aside from the large amount of advertising expenditures involved, is that it is the first national sales drive in which almost every unit in the ice and ice refrigerator industry will have a part. Fully 90 per cent of the industry will cooperate in the 1936 campaign, its sponsors assert.

Sales Contests & How to Run Them

NO. 10—'CANDLE LIGHTING' CONTEST ON ANNIVERSARY CAKE OR CHRISTMAS TREE IS COLORFUL AFFAIR

By John Kumler, Sales Contest Manager
Buckley, Dement & Co., Chicago

Spirella Corset Co. found the "anniversary contest" idea worked out very successfully. Briefly, the details of the contest plan are as follows:

A huge cake with unlighted candles is exhibited on each anniversary of the company's advent into business. A sale would light a candle.

Mystery gifts in sealed boxes were provided at the close of the contest

for those who light the candles. The value of each gift, of course, would vary with the number of candles accredited to the salesman.

Continental-Illinois Bank varied this idea one Christmas with a "Light the Candles on the Tree with New Savings Account" contest. In this case also, gifts were of a value in proportion to the number of candles an employee had lighted.

'American Home' Open In Radio City's Gardens

NEW YORK CITY—Equipped with year-around air conditioning, all-electric kitchen, and other conveniences, what is said to be "America's most inexpensive modern small house," was opened on one of America's most expensive sites—the eleventh floor in Radio City's Gardens of the Nations here recently.

Culminating years of study by architects, engineers, and builders, Future House demonstrates throughout the coordinated planning of scientific housing. Its opening marks the exhibition of over 500 "New American" demonstration homes constructed in key locations throughout the country as part of a program inaugurated by the General Electric Co.

Using 80 per cent of usable space, as contrasted with the 65 per cent usually found in a house of this type, Future House, arranged by Caleb Hornbostel for exhibition in the horticultural hall of Rockefeller Center, adapts the basic plan of "New American design No. 20" to semi-northern climates. It has been duplicated at Wantagh, L. I., for approximately \$5,000.

Space has been made available through planned placement of windows and doors and similar interior details. The home's arrangement and external appearance evolved from the "use-sequence" of its rooms and labor saving equipment, say Walker and Gillette, designers of the basic plan, who assert that it was built from the "inside out."

Homes to be opened throughout the country as part of the original 500 demonstration models are of varying sizes and styles, having in common only the use of electric kitchens, air conditioning, modern building materials, scientifically planned lighting, and more provisions for outdoor living.

Model Kitchens Are Placed Opposite Cashiers' Desks

PHILADELPHIA—The four model all-electric kitchens recently installed by the Philadelphia Electric Co. for display purposes are located directly across from the cashiers' desks, so that anyone paying a bill or passing to the service desks cannot miss seeing them.

Dual mission of these kitchens is to aid sales of individual appliances and to educate the homemaker in the use of the complete electric kitchen. Officials believe visualization is the most convincing form of education.

The four kitchens are side by side. First in line is the "Blue Gingham Kitchen," done in the Early American style and equipped with all modern conveniences.

The next two illustrate the "Before and After" idea—one is typical of the kitchens before the 1915 to 1920 period, drab, badly lighted and inconveniently laid out; the other is a remodeled all-electric edition of the same size kitchen, with working units arranged in the order of their daily use. Appliances, walls, and cabinets are all painted in light colors.

The fourth kitchen is the deluxe model designated as the "Work-Saving All-Electric Kitchen." The lighting in all kitchens is designed to eliminate shadows no matter where the worker stands.

82 Crosleys & 15 Icyballs Sold in Town of 2,400 In Spite of Dust Storms & Floods

RUSSELL, Kan.—Dust storms and floods haven't cramped the selling style of Wood & Richardson, Crosley dealer in this town of 2,400 inhabitants. The firm has sold 82 Crosley electric refrigerators and 15 Icyballs (absorption units) so far this season.

One reason for these sales is an outstanding sales promotion stunt staged by the firm in cooperation with the local Chevrolet dealer, who received a shipment of trucks at the same time the Crosley dealer received a shipment of 10 refrigerators. Ben Wood arranged with the Chevrolet company to install a display of the new units and to cooperate with him in a joint parade.

Three trucks were loaded with

Crosley refrigerators, decorated with banners saying "Largest shipment of electric refrigerators ever to arrive in Russell," and paraded through the business district with horns blowing. Ordinarily such a disturbance would have put paraders in danger of arrest, but Ben Wood is local fire chief, and managed to ward off interference.

After the parade, the refrigerators were unloaded in front of the Wood and Richardson store. Three refrigerator sales were made the day of the parade and four the following day.

Assisting Mr. Wood were Byron Callaway of the American Electric Co., Crosley distributor in St. Joseph, Mo., and H. C. Troyer, specialty salesman.

BOOKS

Public Speaking as Listeners Like It

Author: Richard C. Borden. Publisher: Harper & Bros. Pages: 111. Price: \$1.50. Book Review by Jane Bassett.

ON the jacket of this book it is mentioned that Author Richard C. Borden has "addressed the executives and salesmen of such corporations as General Electric, General Motors, Westinghouse, DuPont, Edison Laboratories, Marshall Field & Co., etc."

This being true, it is possible that many readers of ELECTRIC REFRIGERATION NEWS have heard Mr. Borden speak—in which case they probably will pay especial heed to what he has to say on the art of talking on one's feet. To those who haven't heard Mr. Borden, it might be well to mention that he is Administrative Chairman of the Department of Public Speaking of New York University.

Mr. Borden's approach to his subject is as logical as it is novel: he considers everything from the listener's point of view.

"The principles in this book," he writes, "are formulated by the greatest living authority on public speaking—the man who listens to you. If you apply these principles, your listeners will like you. They will believe you. They will understand you. They will follow you. And these responses you must get. Unless you get them, your speech is not a speech. It is a mere performance."

Four successive stages in audience reaction are summarized in four phrases culled from today's clipped argot: "ho, hum," "why bring that up?" "for instance?" and "so what?" How to overcome these attitudes is a discussion which occupies most of the book. Concrete examples, with "do's" and "don'ts," are given.

Although not long, this book considers each type of speech: the formal platform address, the after-dinner speech, the conference comment, the speech of introduction. The book is designed primarily as a practical manual for the use of anyone who may be called upon to address groups of people—particularly business groups.

Printed in large type with ample margins, and making use of short sentences and a brisk style, the book is easy to read and digest.

MANUFACTURERS DISTRIBUTORS JOBBER DEALERS SALESMEN

You will want 1936 to be your best year. Upon your knowledge of what's new in the industry, and upon intelligent direction of your business in its relation to improvements and developments, will depend much of your success. Alert study of new methods and new products, together with general information of industry-wide importance, demands your attention. Read thoughtfully the current issues of the NEWS, featuring parts, materials, and supplies. They furnish a survey of the individual products which make up a refrigerator and of what is being done throughout the industry to improve them.

\$500,000,000.00

Advertising Experience

— So What?

SINCE the day Lord & Thomas began business nearly seventy years ago, our clients have invested through us over \$500,000,000 in advertising. More than one-third of that amount (\$180,000,000) has been placed through us in the last five years of depression.

"So what?" one may properly ask. And to that question, here is our answer:

\$500,000,000 buys a lot of advertising experience. And the period of seventy years spans four major economic cycles in this country—cycles that embrace every phase of growth, prosperity and depression.

Naturally, so much experience, acquired under such a wide variety of conditions, leads to a definite point of view. It leads to principles that make advertising ventures safer and more profitable. It leads to habits of alert and aggressive response to every crisis or change.

Such qualities distinguish both the history and the present practice of Lord & Thomas.

Money-Making Principles

Just thirty years ago, Lord & Thomas startled the business world by defining advertising for the first time as salesmanship-in-print. Which means: "give the

consumer in an interesting way, the REASON-WHY it is in the consumer's interest to buy the wares you have for sale."

Time has richly fulfilled the meaning of those words. Today we know ways to search every advertising project for the winning reason-why. We have fully developed the technique to *recognize* the great selling idea—to power it with drama and exciting news—to drive it with lightning impact straight to the mark of consumer interest.

These things are not easy to do. And few are the men who can do them.

So it is that a Lord & Thomas advertising program usually starts with the *odds in its favor*. Creative ability, seasoned experience and *pre-determined results* combine to insure maximum safety and profit.

The responsibilities of investing \$500,000,000 for clients in advertising have taught us these exact methods of salesmanship-in-print. And the experience of 63 years proves that only when advertising is salesmanship-in-print can it hope for enduring success and continuous profits.

LORD & THOMAS • *advertising*

There are Lord & Thomas offices in New York; Chicago; Los Angeles; San Francisco; Toronto; Paris; London.
Each office is a complete advertising agency, self-contained; collaborating with other Lord & Thomas offices to the client's interest

PERSONALITIES

By George F. Taubeneck

Sam—In a Book

Today there came to our desk a 60-page book (pages are unnumbered, but we counted 'em, by golly) containing 32 of the helpful little talks for salesmen which have been appearing in *ELECTRIC REFRIGERATION NEWS* under the heading, "Sales Idea of the Week." Title of the book is "Sam's Selling Slants." It is published by Greenberg.

We don't need to tell you that the author is Vernon E. ("Sam") Vining, department store sales manager for Westinghouse. The homely, loveable "map" of this gentleman—which is so familiar to a large portion of the industry—appears on the jacket of the book.

Nor do we need to tell you that the "Selling Slants" are good. You have read them, and many of you have told us how much you have enjoyed them and how useful they are.

What we should like to tell you is that this book sells for just a dollar, that it is well printed and bound, that you will be proud to have it on your desk, that it should be darned handy for sales managers who need material for morning sales meetings, that salesmen should carry a copy around in a coat pocket, that executives will find it useful in preparing after-dinner and convention speeches, and that "Sam" gets 15 cents for every copy you buy.

Readers who may have noticed Mr. Vining's flattering remarks in the "Letters" column of this issue about our series on John Patterson may be inclined to accuse us of "logrolling." But let us hasten to explain that we are late in publishing the letter, and that if we didn't think "Sam's Selling Slants" were pretty swell we wouldn't have been publishing them in *ELECTRIC REFRIGERATION NEWS* all this time.

Testimonial

When the Hotel Gibson, Cincinnati, air conditioned its food-serving establishments, the management was concerned about the high cost of the installation. But not now. Look at this record through the summer (largely attributed to conditioning):

Increase in number of patrons...43%
Increase in total sales per day...45%
Increase in amount of individual checks22.5%
Increase in net profits.....30%

If you want to hear a good, heartening story about the value and benefits of air conditioning, just go down there and hear the tale of their experience with it. Patrons eat more, food keeps better and seems more appetizing, and more people come into the establishment.

Inasmuch as almost two-thirds of the expense of a first-class restaurant go normally for overhead, and since that overhead would go up but little if the restaurant handled 50 per cent more customers, the increase in business brought by the Gibson's 45 per cent rise in total sales per day came pretty close to being pure velvet.

Motorists, Beware!

"The hell of it," grimaced the state trooper, "is that Cuyahoga County is all incorporated. Cleveland is for all practical purposes a state by itself. We stay strictly to hell out of there. Look at this—"

Pointing to a State of Ohio Highway Patrol map—which was intertwined with colored lines and symbols pregnant with meaning to a trooper—the captain of the Findlay station indicated a space which was quite blank on the map. It was Cuyahoga County (Cleveland and suburbs). So far as state troopers are concerned, Cuyahoga County simply isn't on the map of Ohio.

"Cooperation? Why, if we're tracking a man and he gets into Cuyahoga County, he might as well be across the border in Canada.

"Just a couple of weeks ago we found a couple of Cleveland detectives dead down here. Do you think we could get Cleveland to answer on the radio? No, by gum! We had to send 'em a special message through commercial channels that a pair of their own men had been bumped off.

"Now take your case. If that had been a policeman from the city of Dover who had arrested you on a state highway, we could have got your money back; for normally a municipal officer has jurisdiction only in his own city limits—although he can chase you for four miles outside the limits.

"But you were taken in by a patrolman from the village of Dover. That's in Cuyahoga County. It's all incorporated. They can pull you in for speeding even if you're parked beside a babbling brook. And there's nothing you can do about it—nor I.

"As for us, we rarely nab a man for speeding—only for reckless driving when he's crowding and endangering others in traffic."

My "case"—which had been burning up the writer of these lines for more than a week—was being hauled in by a policeman in an unmarked Ford coupe while ambling down a four-lane highway (open country) at 2:45 a.m.—nobody else on the road but the two of us.

As any number of people in the refrigeration industry will testify, if a Ford coupe "hauled down" the writer's Auburn speedster, he must have been "ambling along" at a relatively leisurely pace.

The cop became highly abusive, and ordered us back to the village of Dover. There he took us to a little frame jail-house, and ordered us to fork over \$35 or go to jail. He was armed, and there was nothing to do but listen to the abusive language and pay the money.

There was no "justice" or desk sergeant to "try" the case—just this patrolman. To us, it seemed just like armed highway robbery.

A week later, sighting a State Highway Patrol station (an elaborate establishment) just outside Findlay, Ohio, we went in and related the

story. The troopers were sympathetic; but said that nothing could be done about this sad state of affairs. Cuyahoga speed traps pay their taxes this way, the troopers indicated, and the patrolmen work on commission.

"There's a couple of other speed traps to beware of in Ohio just now," warned the Findlay state trooper. "Columbus is running a drive at present; and some deputy sheriffs are operating a racket on the environs of Toledo. They'll run you in if you take it out of second gear over there."

Sure enough, three miles outside of Toledo on Telegraph road, we sighted a motorcycle cop in the rear-view mirror. Holding it purposely at exactly 45 miles an hour (the Ohio highway speed limit) we watched. He putted along behind for a few moments, and then sirened his way around.

We were escorted to the basement of a farmhouse, where a man in shirt-sleeves, galluses, and an old felt hat (which he did not once remove) heard the cop charge us with driving 50 miles per hour.

Talking like a Dutch uncle, we managed to persuade the "justice" to suspend the sentence. But he levied "costs" of \$5.20!

Moral: watch your step (on the accelerator) when in Cuyahoga County and on the outskirts of Toledo.

Potts' Jingle

F. E. POTTS of the sales promotional and educational division of Frigidaire's air-conditioning and commercial department has concocted a jingle which he gave to this department to read the other day. We enjoyed it, and think you will, too.

Take it away, Mr. Potts:

An automobile's something that
We ride in—costs a thousand flat,
Gladly buy and drive till spring
When we can trade the ancient thing.

A Frigidaire keeps foodstuffs cold
And guards the health of young and old,
Costs but a little—yet, my dears,
Must absolutely last ten years.

Sales Manual in Verse

Demure WINNIE HUGHES, who works for us here in the editorial department, seldom says anything more than "yes, sir." But apparently she doesn't miss much, for the other day she dropped this "poem" on our desk and fled.

In it she has summed up a lot of sound ideas on electric refrigerator selling which have been appearing in *ELECTRIC REFRIGERATION NEWS*. The verses may creak a bit, but they contain plenty of good advice for novice salesmen. Gentlemen, we give you—Miss Hughes:

Sing a song of salesmen
Filled with vim and verve
Canvassing their prospects
With courtesy and nerve
Sing a song of salesmen
Men who never drink
But work and read and prospect
And think and think and think.

The life of a salesman is happily spent
(Or so the sales managers say)

It's crammed with adventure, success, and content,
And sweet dreams at the end of the day.

Fine Horses Are Tom's Hobby



Horses are a hobby with Tom Pendergast, well-known Universal Cooler Corp. executive. Here he is driving a pair of the prides of his stable.

But that doesn't apply just to the "star"—

For "dazzlers" in selling are dead—
The man who succeeds, who's the best by far

Is the man who uses his head.
He must be all-knowing; arguments fine

Must issue authentically from his lips
And the features and factors concerning his line,

Should be on his finger-tips.
He has to be courteous, kindly, and nice;

His clothes, they must ever be pressed—
It's far from his ethics to ridicule ice,

Such a thought is just never expressed!

He must smile when he gets to some hostile front door,
And stand well away when he rings,
He must get his prospect's attention before

His sales presentation takes wings.
He must say that his product has features galore

That are found in few other machines;
He must show her a picture of kitchens equipped

Beyond the wildest of all her dreams.

There's health he must play up—
It's bound to be good

If a child is en-toyed on the floor.
Next he must tell of safely kept food,

(And try to get inside the door!)
He must tell how the purchase will save Prospects' cash

And ice cubes will brighten up drinks,
How left-overs can be made into things besides hash.

(He must guess what his prospect thinks.)

He must say "Mrs. Prospect, I'd like to call back

And meet Mr. Prospect tonight—"
And if this young salesman has got the right knack—

The housewife will say "That's all right!"

When he makes a call back he must be quite clever,

His appearance must glisten, his eyes ought to gleam.

He must courteously enter and quietly endeavor

To sell Mr. Man this marvelous

machine.

If he has trouble in getting his man
To John Hancock on the right line
He must get both his prospects—if he can—

To the showroom at some future time.

Once there, he must demonstrate with all his pep

And perhaps, get the help of some salesman there

To put in a word concerning the "rep"

Of the company. In selling all's fair!

When his sale has been made he still isn't through;

He must go back and question the "user"

Concerning the names of people who Use iceboxes—that's one good sales booster!

The salesman's life must include lots of reading

Of hobbies; he must know some facts,
For many a sale comes from salesman's heading

Some little, half-lusterless tracks!
His personal life must be that of a famed Rover

Boy, that is, when it comes to drinking;
For the man who lives with a constant hang-over

Will get tangled up in his thinking!

Will get tangled up in his thinking!

Will get tangled up in his thinking!

Will get tangled up in his thinking!

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Will get tangled up in his thinking!

It's a Long, Long Story—and These Headquarters Men Have the Job of Putting It Across



(1) Back to headquarters with a headfull of ideas. A representative of Lord and Thomas, Frigidaire agency, hastily lights up before catching a train from Dayton for New York City. (2) Frank C. Lyons, assistant publicity director, purns over Frigidaire's 1936 publicity plans. (3) "What did we get on that Roosevelt Hotel story?" Publicity Director Jim Irwin wants to know. (4) This Frigidaire release will go to market after Mr. Lyons gives it a careful copyreading.



(1) Roger Bolin, sparkplug of Westinghouse's sales promotion department, works on the plans for next spring's refrigeration presentation programs. (2) Paul Endress of the sales promotion department is a little man who's a big help in putting across Westinghouse sales and advertising ideas to dealers. (3 and 4) V. E. "Sam" Vining, director of department store sales, and author of "Sales Idea of the Week," a regular News feature, has a modern new home in Mansfield. His book, "Sam's Selling Slants," has just been published by Greenberg's, New York City.

*Big Things are Happening
at Kelvinator!*



Reading around the table: G. W. MASON, President . . H. W. BURRITT, Vice-President, Sales . . B. B. GEYER, Advertising Counsel . . H. W. NEWELL, Advertising Counsel . . V. C. WOODCOX, Advertising Counsel . . C. S. MITCHELL, Advertising . . J. A. HARLAN, Sales
G. STRELINGER, Sales . . V. J. McINTYRE, Sales . . E. A. SEIBERT, Service . . ALEXIS de SAKHNOFFSKY, Consulting Designer . . C. C. THOMAS, Engineering . . E. HEITMAN, Chief Engineer . . G. M. EVANS, Vice-President, Manufacturing . . H. G. PERKINS, Vice-President

1935 has been a prosperous year for Kelvinator distributors, dealers, and salesmen.

It will mark the twenty-first successive year in which our company has sold more electric refrigerators than in the previous year. An unmatched record in the industry!

Today a new Fall Program is ready, a program that is one of the most complete and effective promotions we have ever offered to our field organization.

And today, in the Kelvinator plants, with the most intensive preparations

in the history of our company, we are putting the finishing touches on plans for 1936.

We feel that the industry is ready for one manufacturer to assume a greater measure of leadership from the standpoint of product development, promotion, distribution and advertising.

With new products, new personnel and a unity of ideals and purpose, Kelvinator, the pioneer of the industry, accepts the challenge of that objective for 1936.

G. W. Mason

Kelvinator

The Only Electric Refrigerator for 1936 with the _____ !

Norge Merchants Give Hints on Hiring, Compensating, and Educating Salesmen

Editor's Note: Prepared under the direction of James A. Sterling, director of advertising and sales promotion for Norge Corp., and Gerald E. Stedman, vice president in charge of market planning for Cramer-Krasselt Co., the Norge Merchant Training Manual is a composite of information on successful merchandising practices gleaned from Norge dealers all over the country.

Utilizing lengthy questionnaires, Messrs. Sterling and Stedman drew out from the Norge field organization the best dealer selling and operating methods which have been evolved from their experiences in selling electric refrigerators during the last several years.

These gentlemen have granted ELECTRIC REFRIGERATION NEWS permission to extract and condense information contained in this manual—a job which has been completed by Frances McNamara of the editorial staff.

THE volume of sales made per dealer depends mainly on the number of salesmen maintained. Since there are certain fixed overhead expenses which do not change regardless of the number of salesmen maintained, it stands to reason that net profit will increase if more salesmen are added.

According to the industry average, each dealer should have at least five salesmen. The dealer should devote most of his time, outside of the responsibilities of his retail function, to supervision of his salesmen. He should spend very little time in actual selling.

Hiring good salesmen is a major problem. To save trouble and expense, the merchant should have a clear conception of the essentials of a successful salesman. He should find out whether a prospective salesman likes people, whether he reacts to helpful motives, whether he acknowledges that profit is the reward for service rendered, and whether he can sell the product with something approximating religious fervor.

Qualifications for Salesmen

Five principal qualifications a successful salesman should have are ability to do a real selling job, control of his temper, ambition for advancement, capability of remaining indifferent to discouragement, and ability to sell himself to the dealer when interviewed.

Classified advertising is usually a poor means of obtaining applicants for a sales job, because the majority of men who answer such advertisements belong to a class of floaters.

In building up his resale organization, the dealer should, as a last resort, be able to obtain help from his distributor. In most large cities,

the distributor has a centralized enlistment plan by means of which it finds, selects, and gives preliminary training to salesmen. These salesmen are then assigned to dealers who agree to handle each salesman properly thereafter.

Three sources of prospective salesmen not usually tapped are satisfied owners, women who like to work part or full time, and men over 50 years old who have keen human understanding and sufficient energy, but find it difficult to get located anywhere else.

Salesmen Build Good Will

The satisfied owner feels good will towards the company, the dealer, and the salesman and will not only sell the good points of the refrigerator she has purchased to those with whom she comes in contact, but will also furnish prospect leads to the salesman.

If the merchant calls the satisfied user and confides that he is going to add one or more salesmen to his staff and hints that he is anxious to make the right selection, the satisfied user is willing to furnish all the leads to prospective salesmen she knows.

Many women are eager to sell appliances. By inviting various clubs to the store for educational demonstrations, the dealer can find those who are interested in assisting him from the selling standpoint. Women like to do this type of work and may often be obtained at a lower commission rate than the average salesman.

Women Are Successful

Women are highly successful in selling appliances to women—they understand actual home use of the appliances and are able to appeal to the interests of the housewife more than the salesman who has little understanding of the problems of kitchen and home laundry.

The man above 50 years of age is generally the "forgotten man" of the industry—at the most productive point in his life. Many men above 50 have lived rich lives, have keen brain power, and react to the sympathies of home life. They are old enough to command respect and do not as a rule arouse fear or doubt as is sometimes the case with younger men.

During the course of the day, the older man will see more people and tell a more effective story than the younger man because he has the ability to systematize himself and does not have as many distractions.

Well-Worded Classified Helps

As a rule, it is not advisable to use classified advertising to obtain prospective salesmen, but a carefully worded classified "ad" addressed to men over 50 years of age will usually bring in the type desired.

Many successful salesmen have been obtained from the ranks of

printers, paper hangers, painters, factory workers, policemen, street-car conductors, and others thrown out of work by the depression.

It has been found easier to train new salesmen than to re-train old ones. Those who have had previous sales experience often find it hard to adjust themselves—they are constantly trying to get the dealer to adopt their experience instead of following the dealer's policies and ideas.

Proper earning opportunity and incentive is necessary not only to enlist salesmen but to keep them satisfied. The dealer who expects to get maximum effort from minimum compensation will find his sales volume and profit limited.

Forms of Compensation

One form of compensation is the commission and bonus method. The commission rate depends largely on the sales possibilities. If the dealer gives the salesmen such unusual sales support that the salesmen find it easy to close prospects, lower commission rates will interest new manpower. If the dealer provides his salesmen with little sales support, larger commissions will be found necessary.

The commission rate is usually between 10 and 15 per cent of the retail price. Special bonuses may be offered also to encourage campaign activity and incentive.

The average salesman cannot work at his best if he is worrying too much about making ends meet. The commission rate and sales support should be of such a nature that he will be assured of a minimum monthly income providing he uses proper industry.

Start Selling Early

New salesmen should be started on the actual selling road as soon as possible, not kept straining at the leash. If too long a training period is employed, the salesman loses ambition. If he is allowed to go out with an experienced salesman and see how selling is done, or if he is given a couple of sure prospects, he grows more enthusiastic and he also sees the necessity of careful training.

The dealer should remember that he has a substantial investment in each new salesman he adds to his staff and that each man should have correct training in order that he may be profitable both to the dealer and to himself in the shortest time possible.

Each merchant has a definite obligation to the salesmen on his staff, for it is only through their success that he can progress. Rightly planned, the sales training course should increase the performance and earning power of each salesman each month and should reduce personnel turnover for the dealer.

Need for Study and Application

The merchant who conducts a successful sales training course impresses his salesmen with the need for constant study and application. If the salesman becomes satisfied or fails to keep up with new selling methods he is bound to fail. Knowledge means more selling power.

The dealer sees to it that his men use skillfully the tools provided by him and by the manufacturer; he points out the achievement of other salesmen to inspire in the individual salesman the will to outdo his associates and create confidence in the methods used; he makes sure that every salesman understands points of each campaign and sees that each man is performing in such a way as to tie in with these campaigns to advantage.

Reactions Different

With regard to successful sales training, the dealer must remember that salesmen are human beings and that different personalities react to different treatments. One man can be driven, another must be encouraged to reach greater sales achievement.

The dealer must be careful not to antagonize his salesmen by being superior—he should talk with not to them. If possible, he should arrange things so that the point he wants brought to the fore be voiced by some member of the organization. An associate's word is often more readily accepted without discord than an employer's.

Most people prefer to do business with a personality. The successful dealer merchandises his personality—he makes himself so well liked and respected by his salesmen that they strive to make more sales for his sake as well as their own. Some little kindness to the salesman or his family gives the additional verve that the salesman needs to drive him to greater accomplishment.

Repetition Helpful

Repetition of a few essential ideas is more profitable than attempting to use a flood of new ideas. Important points, even if old methods are used, should not be neglected for the sake of some new idea. Old methods may be used with a new angle.

Specific daily instruction with regard to assignment and prospect should be given by the dealer to his salesmen. If a new sales idea is advanced the dealer should always provide specific suggestions as to

Sales Idea of the Week

By V. E. (Sam) Vining, Director of Department Store Sales, Westinghouse Electric & Mfg. Co.

Hurrah for the radio.

Hurrah for bum teeth. Hurrah for funny odors. Hurrah for 40 mules hitched to a wagon (maybe only 20). Hurrah for pimples and faulty skin. Hurrah for bum coffee. Hurrah for hooley—and

Hurrah for blood and gore as bedtime sedatives, and unmentionables as table topics.

Hurrah for all the things that are teaching me the error of my ways.

I've been all wrong all my life. Here I've been thinking I was in this business of selling things to increase the contentment, convenience, and happiness of the race, only to discover that—

Instead of preaching progress, I should have been fighting the errors of the past.

Practically no progress.

Construction—give it the air. Destruction—give it the air.

Uncle Will—he died with throat trouble, so I've been told by my elders. Now, I suspect a rope helped him because he was always fond of horses.

Grandpa—I had always believed dropped over of heart trouble on his ninetieth birthday as he stood with one foot on a rail fence looking at an old sow trying to serve two more customers than she had stools at her counter.

Apparently I was wrong, and Grandma killed him because he had halitosis—or sumpin'.

I guess I'll quit trying to sell things and go for a ride with Balaam.

when, where, and to whom it should be applied.

Effective sales training should include weekly sales meetings, bulletins as needed, enlistment of family interest, and cooperation of satisfied users.

The dealer should plan his sales meeting in advance. He may assign the subject for the ensuing meeting to an individual salesman or he may have a bulletin mimeographed, announcing the subject and asking questions which the salesmen will be requested to answer at the meeting.

Refrigerator's Long Life Stressed in Campaign

ATLANTA—Working to make a quota of 900 household and 90 commercial refrigeration sales, the merchandise division of the Georgia Power Co. is completing its fall clean up campaign on electric refrigerators which began Sept. 10 and which ends Oct. 5.

Newspaper advertisements promoting the sale stressed the life-long investment angle of electric refrigeration, and besought prospects to buy for the future by getting boxes large enough to meet their needs.

"That you may have no regrets," the copy said, "select a refrigerator that has sufficient size now and for the years to come." Special time payment plans and spotlight values were added features in the sales campaign.

Detroit Distributor Finds Sunday Meeting Draws Large Attendance

DETROIT—A Sunday meeting, the first in its history, drew 300 dealers and salesmen to the opening of the Aitken Radio Corp.'s two-day showing of Crosley radios and electric refrigerators, held Sept. 22 and 23 in Detroit-Leland hotel.

James E. Aitken, head of the distributorship, said the meeting was successful because it gave many dealers and salesmen who were too busy to leave their jobs during the week, a chance to attend. Shown at the meeting were the 1936 Crosley radios, the refrigerator line, and the new "super freezer."

William W. Carroll, district manager, and Sam Kehoe, special representative of Crosley Radio Corp., assisted Mr. Aitken and his salesmen in conducting the presentation program.

C. I. T. Finances Emerson & Arvin Radio Sales

NEW YORK CITY—Commercial Investment Trust, Inc., is now acting as official financing organization for Emerson and Arvin radio dealers and distributors. Under this plan a complete retail finance service will be offered from coast to coast.

C.I.T. is also time payment financing organization for the following eight manufacturers: RCA, Atwater-Kent, Stromberg-Carlson, Stewart-Warner, Grunow, Crosley, Sparton, and Graybar.

Monongahela Utility's Frigidaire Campaign Leaders Are Named

FAIRMONT, W. Va.—Four days before the closing date of the Frigidaire load-building campaign conducted by the Monongahela West Penn Public Service Co., the Panhandle division of the utility was in first place with 221.6 per cent of quota. The Morgantown area ranked second with 180 per cent.

On the basis that \$1.00 in sales is equal to 5 kwh., a total of 505,549 kwh. were added to the electric load on company lines. The Panhandle division added 121,872 kwh. and Morgantown, 63,244 kwh.

In third place was the Fairmont area of the Eastern division with 173 per cent of quota. Elkins came fourth with 169 per cent, and Parkersburg fifth with 144.7 per cent.

The Clarksburg division, with the second largest quota in the campaign (60,000 kwh.), exceeded quota by 137.5 per cent.

Top individual salesman was H. H. Powell, Fairmont, with a total of 37,261 kwh. added to the lines by his sales during the two months. Lee Grimm, Elkins, was second with 28,182 kwh.

Other leading salesmen were R. L. Hoffman, Wellsburg; J. S. Killian, Wellsburg; N. M. Jackson, Clarksburg; C. L. Steele, Weirton; A. F. Fervier, Wellsburg; Thomas Torch, Morgantown; H. I. Hall, Morgantown; and Aldo Marziale, Weirton.

Program of Supervision Boosts Krich Sales

NEWARK N. J.—Kelvinator sales throughout northern New Jersey for the month of September were 100 per cent ahead of sales during the same month last year, reports Paul R. Krich, vice president in charge of sales for Krich-Radisco, Inc., Kelvinator distributor here.

"One of the contributing factors to this big gain in sales," Mr. Krich states, "is our complete program of injecting supervised outside manpower in each dealer's store."

Leading New York Dealers Will Attend Annual Norge Convention

NEW YORK CITY—Warren Norge Co., Inc., new Norge distributing organization, will take its leading metropolitan New York Dealers on a four-day trip to the Norge Corp. factories in Detroit and Muskegon, Mich., in January.

The tour is part of a "get-acquainted" campaign by means of which C. B. Warren, president of the distributorship, plans to promote closer contact with dealers.

Dealer sales this year have been over 200 per cent of 1934 on Norge products in the New York area, states E. L. Frolich, sales manager of Warren Norge Co.

EXPECT A

Good Deal

FROM

COPELAND



WHEN you sell a Copeland Household Refrigerator, or a Copeland Commercial Unit, both you and your customer can expect a good deal—in efficient performance, in low cost operation and in extra long life.

Because of Copeland design and engineering, and because of the Copeland policy of quality manufacturing, all Copeland refrigerating units are unsurpassed for efficient performance.

The compact household line comprises FOUR models—every one a winner! The commercial line offers you over 30 models that fit all commercial applications. Back of these two great lines is the Copeland organization and plant, with EXPERIENCE, a superior PRODUCT, financial RESOURCES, and a policy of STABILITY! Get into the Copeland picture, NOW!

COPELAND REFRIGERATION CORPORATION

Manufacturers of a Complete Line of Household and Commercial Refrigeration

Holden Ave. at Lincoln . . . DETROIT, MICH.

Copeland

DEPENDABLE Electric REFRIGERATION

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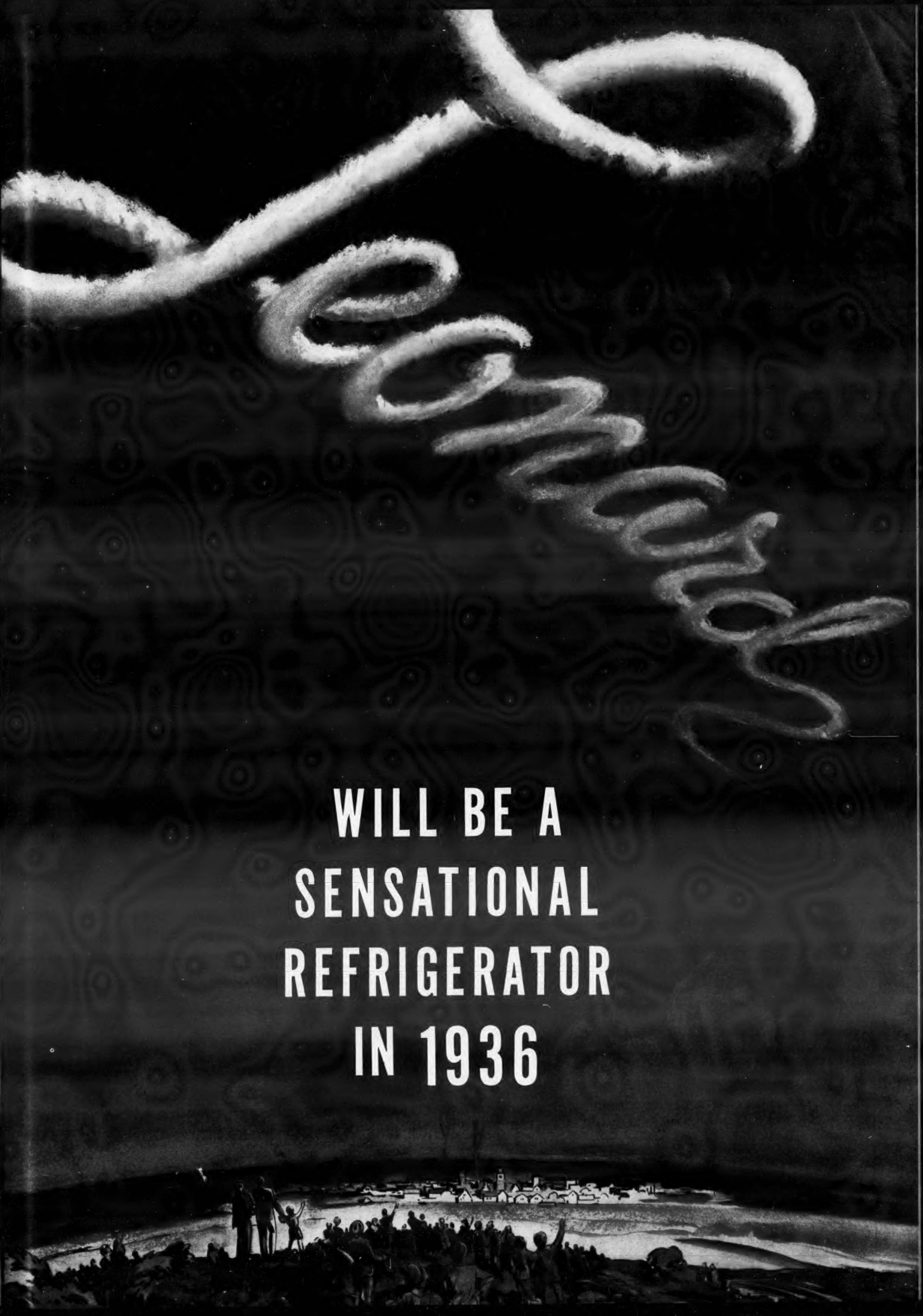
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WILL BE A SENSATIONAL REFRIGERATOR IN 1936



Plans of Salesmen Compensation Are Analyzed and Studied

Review by T. T. Quinn

IT is generally recognized that the fundamentals of a sound plan for salesmen's compensation are closely similar, regardless of the line being sold. Numerous surveys by various organizations have served to emphasize this fact.

In a recent report, titled "Selecting a Plan for Compensating Salesmen," Metropolitan Life Insurance Co. has correlated the findings of these surveys, and formulated a number of plans and practices which may be regarded as standard procedure followed by business men in meeting compensation problems. A condensation of the report follows:

Aims of Compensation Plan

Chief aim of any compensation plan, as far as the company is concerned, is to direct the salesman's activities toward certain desired ends. Some of these are:

- "1. To secure a certain volume of sales.
- "2. To sell items in the line in certain proportions.
- "3. To concentrate on the more profitable items without neglecting the rest of the line.
- "4. To maintain the standard selling prices.
- "5. To concentrate on preferred types of customers.
- "6. To exercise reasonable caution in granting or recommending credit.
- "7. To assist in collecting accounts due.
- "8. To keep returns, allowances, cancellations, and complaints to a minimum.
- "9. To exercise care in incurring expense."

Although the specific plan may be designed to accomplish certain definite results, if it is to succeed it has to meet certain general tests which experience has shown to be necessary for any sound compensation plan, regardless of its aims. These include:

- "1. Simplicity. The plan must be simple enough that both the salesman

and the company can easily understand it.

"2. Fairness. Both company and salesman should be rewarded fairly, and undue penalties should not be exacted from either.

"3. Salesman's earnings. This should be such that the salesman can maintain a living standard on a par with that of the people he must approach. It should be high enough to attract—and keep—desirable men, but neither too high or too low in comparison with what other companies in the same field are paying.

Incentive for Salesmen

"4. Incentives. The plan should provide an incentive for the salesman to do what the company wishes done, in the proportion desired.

"5. Protection for customers. The plan should discourage any action on the salesman's part that might incur the ill-will of the customer or prospect.

"6. Workability of plan. The plan should work in good times and bad. Changing compensation plans with changes in business conditions may unsettle the sales organization, and cause dissatisfaction.

"7. Flexibility. The plan should be flexible enough to meet varying conditions between territories.

"8. Cost of salesmen. Total sales compensation should bear a reasonable relationship to sales volume, both for the individual and the force as a whole. This relationship should be held within certain limits.

"9. Cost of operating the plan. A minimum of clerical cost, with present clerical operations, rather than new ones, utilized. Many a plan has been abandoned because it was too expensive to operate."

Compensation plans, generally, are of three general types, either singly or in combination: salary, commission, and bonus.

Under the salary plan, the salesman is paid a regular amount, which, in many cases, is revised periodically in

accordance with his performance. Performance is measured in terms of sales volume, ratio of salary to sales, ratio of salary to gross or net profits, or some similar "yardstick." Expenses of salaried salesmen are usually paid by the company.

Commission Method

Payment of commission, when salesmen are on this plan, is based on total gross or net sales, collections, shipment, or gross or net profit, depending on the selling practices and problems of the particular company. Some companies base commissions on collections, or on shipments.

Variation may be secured by paying more than one rate, depending on the sales volume, or by shifting the commission base.

Policies on drawing accounts differ, but in most cases, a drawing account means a lower commission scale, since the company must absorb uncollectable overdraws by its salesmen.

Apparently, most companies do not pay commission salesmen's expenses. Others do, because it gives them more authority to direct the man's work.

In practice, commission base, commission rate, drawing account, and expenses are found combined in a great many ways.

Difference of Commission and Bonus

Chief distinction between a commission and a bonus is that the former is a rate, while the latter is a fixed amount. The bonus is generally used as a supplementary feature in the compensation plan, and is paid in addition to a salary or a commission, or, in some cases, both salary and commission.

Bonuses may be given for a number of specific things, such as:

- Increase in sales volume; increase in the sale of a specific item, or items; sales to a certain class of customers; reduction in expenses; sales over quota; or number of calls.

A bonus is invariably paid in combination with some other compensation factor, in a variety of combinations. Most common of these is a salary plus a commission or several commissions. A few examples are:

Salary plus a commission on sales, collections, gross profits, net profits, difference between standard and actual selling price, or sales over quota during dull seasons, the latter to build up sales.

Additional Commissions

Additional commissions are sometimes used in straight commission plans. For example, the salesman may be paid a straight commission on the gross profit on his sales—plus a commission on sales over quota. Like the straight commission, this additional commission may be varied according to the base or the rate, or both.

In the plans known as point systems, the salesman is credited with a certain number of points for each activity, and is paid periodically at a certain rate per point.

There are two flexible features in this system, the booklet points out. The point rating can be changed for a given activity, and the rate at which points are converted into dollars can be changed. In some cases, this latter rate is scaled like some commission rates. Thus, the salesman may be paid 15 cents per point for the first 300 points, 20 cents per point for the next 200, 25 cents per point for the next 100, etc.

Advantages of Salary Plan

Both salary and commission plans have their advantages and disadvantages. Some advantages of the salary type are:

1. It gives detailed control over the salesman. The company can change the requirements of the job, without having the salesman refuse to accept them. Salaried men can be made to turn in regular reports, too.
2. It relieves the salesman of worry concerning his income, and leaves him free to concentrate on his job of selling.
3. It is easy for both salesman and company to understand.
4. It is most inexpensive to operate, from a clerical point of view.
5. It is best where the individual sale requires a long time to close, where the salesman is required to give free service to customers, and where a long sales training period is necessary.

Disadvantages of Salary

But the salary plan also has these disadvantages:

1. It doesn't give the salesman an incentive. He feels that as long as he does a certain amount of work he will get his full salary. Therefore, he is apt to pass up opportunities that a commission salesman will take advantage of.
2. It is inflexible, extremely so. Often, salesmen work themselves up to good salaries, then go to sleep on the job, so that their selling costs rise out of all proportion to their worth to the company. This lack of control over the salesman's selling cost ratio has given many companies a real problem.

Some concerns have attempted to meet this difficulty by relating the men's sales to their salaries, making the latter not over 10 per cent of the

average monthly sales for the preceding quarter.

Another company credits the salesman with a percentage of the gross profit on his year's sales and charges him with the total of his annual salary and expenses. If charges are lower than credit, he gets the difference; if they are higher, his salary for the ensuing year is reduced by that amount.

3. A lot of good salesmen earn less on a straight salary than on straight commission.

4. The salaried man is not as experienced in weathering financial storms as the man on commission. The former is used to getting his salary, and spending it; the latter saves, and knows what it's like to get along on a reduced income.

5. Salaried salesmen often argue with their company over salary matters.

Points Favoring Commissions

The following advantages are claimed for the commission plan of payment:

- "1. It provides the maximum of incentive.
- "2. It is much more flexible than the salary plan. By scaling commissions, companies have graduated the incentive feature according to their own particular problems.

"3. Selling costs can be held to a fixed ratio, especially where the salesman is paid a straight commission, without drawing account or expenses.

"4. If he is a good salesman, the man makes more money on commission than when on salary, because he is paid in direct proportion to production, and does not have to suffer because other salesmen do not produce their quota.

"5. The commission-paid salesman learns how to ride out slack seasons, and live on a fluctuating income, better than if he were on a straight salary.

"6. He assumes more of the executive attitude than the salaried man. He feels himself a partner in the business, and works longer and harder than the man on a salary.

"7. The commission plan weeds out misfits. The salary plan tends to carry them along.

"8. It eliminates unnecessary office work, by keeping the attention of all focused on actual production."

Disadvantages of Commission

But, say some companies, commission plans have these disadvantages:

"1. Lack of control of the salesman. He works as and when he feels like it, and considers his prospects his own, not his company's. Many companies get by this difficulty by making the salesman sign an agreement not to use his prospects for a certain period after leaving the company.

"2. It induces salesmen to obtain volume, without caring whether or not it's profitable.

"3. Salesmen are inclined to overstock customers, and obtain sales by unethical means."

4. Some companies say the salesman's efficiency is impaired by worrying over his income and expenses.

5. Others say that, if a prospect realizes that a salesman is working on commission, a wall of resistance arises to the sale.

6. Many companies contend the commission plan has been used, in so many cases, to exploit salesmen, that most men are suspicious of it and of the organization sponsoring it.

7. It has been claimed that most commission plans involve much book-keeping, and a resulting increase in clerical cost.

8. Turnover is said to be higher under the commission than under the salary plan.

Companies Alternate Plans

There seems to be no definite trend from one plan to another, surveys indicating that, over a period of years, various companies have switched from salary to commission payments, and vice versa.

Many considerations influence the adoption of a compensation plan, and final adoption requires a careful balancing of these considerations. Even after the change, conditions may occur to upset the situation, and make a further revision necessary.

Most times, the plan adopted depends upon the experience of the executives responsible for it. They will usually favor the kind of plan they know most about. If they are inexperienced, they may pick a weak plan; if they are liberal, they may work out an entirely original one.

Seek New Plans

Apparently, however, many executives have never been able to find any one plan which suits them perfectly; and so they are always on the lookout for one showing greater promise. But it is not a good practice to copy the plan used by another company without a careful investigation of its merits.

Commission plans get the most converts during periods of depression, when the cost of selling must be kept in line with profits. During prosperous times, however, the swing is usually to salary plans, because of the greater control they permit.

This switching is illustrated by the findings of a 1931 survey by *Sales Management* magazine, covering 475 companies. The findings showed:

1. A swing away from salary plans, in favor of commissions, bonuses, premiums for more business, and other profit-sharing ideas.

2. Payment plans were being adopted with a view toward their probable effect when business began to come back.

3. Firms which had been operating on a profit-sharing basis were, generally speaking, in better position, regarding compensation problems, than those which had not.

The trend in recent years toward commission payment is being linked with a tendency to relate the salesman's compensation more directly to the profit on his sales. This is shown in the various bonus plans, and in those paying a commission on gross or net profit instead of sales volume.

Product Dictates Plan to Be Used

Choice of payment plan, in most cases, is influenced by the kind of product or service, the type of customer or salesman involved, and the selling methods used.

Some executives hold that product and marketing channels are major factors in choosing a plan. In reporting the results of a survey of the compensation practices of 81 manufacturers in varied lines, H. A. Haring says:

"... Any product distributed through jobbers wholly or in large part is best sold by the manufacturer's salesmen when they are paid on a salary basis. . . . In general, it may be said that the preference for the straight salary system of compensation for salesmen handling jobber-distributed products is becoming more marked every day. In this field, the commission method is on the wane. . . .

"In other fields, the commission system still prevails—indeed, is gaining strength. This is particularly true of companies distributing the following types of equipment: machinery and equipment—industrial, domestic, and office. . . . and other commodities in which style is an important factor in the marketing."

Attitude of Manufacturers

Summing up the 1934 attitude of 81 manufacturers, Mr. Haring finds:

1. A company is committed to one type of compensation plan or another more by the nature of its product and the manner of its distribution than by the preference of the management.

2. There is evident, in many large concerns, a trend away from salary and toward commission or bonus plans of payment. The better salesmen demand it; the companies prefer it.

Some sales managers hold that specialty salesmen should be compensated on a commission basis, and salesmen of staple goods on a salary basis, with or without an incentive feature.

In a survey of office equipment manufacturers, it was found that 66 per cent of 30 manufacturers reporting were using the commission type of plan. Two reasons were given for their choice: 1) it provides the greatest incentive by paying in direct proportion to work done, and 2) it holds the cost of sales to a fixed ratio.

Salesmen of newspaper advertising, it was found, were in most cases paid on a salary basis. Of 55 plans reported, 80 per cent were of the salary type. Eleven publishers used commission plans, but only one for his entire advertising force. Others used the commission plan for special pages, the classified section, and similar exceptions.

Four main reasons were given for publishers' preference for salary payments: 1) the amount of the salesman's sale is not a complete measure of his worth; 2) commission salesmen tend to oversell, and to use high-pressure methods; 3) salary plans permit salesmen to spend sufficient time with an account to develop it; and 4) salary basis assures salesmen of steady income, and frees them from financial worries.

In the heavy machinery field, salary plans were most popular. Sales in this field often require a long period of negotiation, which would suggest the salary plan as the one best suited to this field.

Wholesalers, generally, preferred the commission plan, with the commission based on either gross or net profit. Drug wholesalers, a survey made in 1933 showed, are almost 100 per cent back of the commission form of compensation. A similar situation is found among wholesalers of automotive equipment, paper wholesalers, and wholesale grocery houses.

There is and has been considerable discussion as to the type of man who sells best under commission and salary compensation plans, but no hard and fast rule has as yet been found. The type of plan, it seems, makes little difference in a salesman's work.

"It isn't as much a question of the plan of compensation," says an equipment manufacturer who has tried both salary and commission methods, "as it is a question of the ability of the salesman. We have had outstanding successes by men in all plans. . . . The man who is a real salesman has the ability to make good, likes our kind of equipment, works hard at it, and is a success no matter what plan he works under, while the reverse is true for the mediocre type of man."



Pahdon Mah South'n Accent Mah Name's Humid Air

Me and my gang does the most damage down round the Gulf Coast. That's where our work is easiest but we're pretty tough guys in the kitchens up North as well.

I cover the surface of a refrigerator with a thin moist film. I search for and point out spots in the finish where my pals, the Rust Boys, can get through. Once the Rust Boys get going that's the end of the finish and the box has started it's way to the junk heap.

AND—THEN is the owner sore and does he kick to the guy who sold it to him.

There's only one finish we can't damage and that's Bradley & Vrooman High Bake Porcelain. It practically fuses itself to the metal over which it's applied and we just can't get through it.

For the love of Mike, don't mail the coupon at the bottom of this Ad. or you'll be spoilin' our fun.

COUPON

BRADLEY & VROOMAN CO.,
Chicago, Illinois.

Send information regarding Gulf Coast humidity and other tests that prove High Bake Porcelain to be superior to all other refrigerator finishes.

Firm Name

Address

By

Commerce Bureau Report Shows Market for Refrigeration and Comfort Cooling in Panama

THERE are approximately 1,000 household electric refrigerators in use in the Republic of Panama, and 1,450 are installed in the Canal Zone, according to figures recently issued by the Department of Commerce.

Six of the major American electric refrigerator manufacturers have representative sales outlets in these territories. While the population of the Republic of Panama is approximately 460,000, two cities, Panama, with 77,500 inhabitants, and Colon with 30,000, are the only localities where electric refrigeration can be used at present, the report states.

One dealer is quoted as stating that 25 per cent of the sales made this year are replacement sales.

In the Canal Zone there are said to be 3,350 household quarters that could employ electric refrigeration, and 1,450 of these already contain this equipment.

Handicaps to Dealers

Retailers of refrigerators in these regions face several distinct handicaps, the report points out. First, the purchasing power of the population is in the main very low, and the incomes irregular. Since Panama is a bi-lingual country where both Spanish and English are spoken, sales literature, and sales representatives must employ the Spanish language.

Climatic conditions raise technical problems involving insulation, that have not yet been met satisfactorily by the manufacturers of refrigerators selling in Panama, the report states. The annual maximum temperature is 74.4° F. while the minimum is 73.5° F. Average relative humidity is 88 per cent.

Service Problems

With such existing temperatures, units installed constantly need servicing. Cabinet woodwork is subject to attacks by termites. Condensation of moisture formed when a cool section of the box meets the outside air, and sweating which occurs around the doors, and in some instances on door linings, result in a soggy, unclean condition that lessens the cooling efficacy of the refrigerant.

Other mechanical difficulties present result from moisture accumulation when the motor is outside the cabinet, and wiring difficulties occurring when the electric switch is placed outside the cooling unit and apt to cause a short circuit.

Wiring Must Be Isolated

Engineers have found that electric wiring must be isolated from any possible contact with the cabinet, since the cabinet becomes totally grounded, and when charged with electricity, no part of the box can be touched.

Import taxes which (for the Republic of Panama) amount to 15 per cent of the value of the purchase, plus a 3 per cent consular fee, are also a drawback to sales. Panama is considered a foreign market, and in regard to the merchandising of electric refrigerators and hence taxable, the Canal Zone is also, the bulletin states.

Most popular method of financing sales in the Panama Canal Zone is through the medium of a "club." A system is in effect by which 100 consecutive numbers are set up, and a customer participating in a club sale chooses a number, and pays for it weekly over a period of time. If the number held by the customer is similar to the last two figures in the weekly drawing of the National lottery, the customer gets his machine at considerable discount.

Promotion Methods

Promotion methods employed to snare sales consist mainly of newspaper advertising, and the refrigeration clubs. Few prospects are contacted in their homes. Distributive outlets consist of hardware dealers, radio dealers, electrical contractors, and one light and power company.

Present substitutes for electric refrigeration in this area are kerosene refrigerators and ice boxes. Few kerosene refrigerators have been sold here to date, but a new agency handling the line is pushing its sale in the Interior.

Ice refrigerators are mainly of local make. One recently introduced American product with an improved design, and selling on a time payment basis, is said to be gaining popularity.

Associations formed by several companies are distributors of ice in central localities. Five cities in the Interior have independent ice companies. Prices for ice range from 35 cents per hundred pounds in the Canal Zone to \$2 per hundred pounds in David, in the Interior. One unusual factor concerning ice distribution, is that many Chinese merchants resell the ice from the boxes where they keep their perishables.

Schedule of electric rates for residents in Panama City and Colon, effective May 1, 1935, and applicable

to customers who have received service under any of the previous rate schedules for three consecutive months, is 8 cents per month for each of the first 75 kwh., 5 cents for each of the next 75 kwh., and 5 cents for each additional kwh. during the month.

Special Rates Offered

Special rates are made for employees and organizations of the United States Government in the Panama Canal Zone. There are also special rates for new customers who do not come under the classification in the preceding paragraph.

The report also furnishes some enlightening information regarding Panama as a potential market for an air-conditioning specialty. Tropical conditions in Panama make the care of clothing, linen, and etc., a special problem in every household. Present facilities to combat this, consist of "dry closets" wired for electricity.

Carbon filament bulbs are used in these closets as small electric heating coils, and the current is in almost continuous use. Objections to this system are that the lights fade clothing, and that heaters are dangerous as fire hazards.

This leaves a wide-open market for a small device with an automatic cut-off calculated to reduce the humidity in the "dry-closet," at a low initial cost, the bulletin states. Defective insulation of the present "dry-closets" is an important factor to be considered in the development of such a product.

Reader's Sells 2,000 Units Using FHA Financing

HOUSTON, Tex.—Utilizing the opportunities offered by the FHA program, and employing approved sales promotion aids, Reader's Wholesale Distributors, Crosley outlet here, has sold 31 carloads—totaling 2,000 units—of Shelvadors this year, states Hymen Reader, president of the company.

"A substantial part of these sales has been made since the government launched its program to encourage home ownership and the ownership of electric refrigerators," said Mr. Reader.

Houstonians have taken advantage of the provision of this act whereby wage earners of good reputation, whether or not they are home or land owners, may purchase electric refrigerators on small time payments, spread over a three-year period, Mr. Reader said.

Paper Sponsors Exhibit Of Niagara Dealers

BUFFALO—The Electrical League of the Niagara Frontier, with headquarters here, held its newspaper sponsored Electrical Show which lasted a week, here recently.

The news sheet of the League described the show in detail, and pointed out that the *Buffalo Evening News* announced the show, marking the first time that the local paper had sponsored such an exposition.

Our Error

In an article on page 4 of the Sept. 4 issue of *ELECTRIC REFRIGERATION NEWS*, concerning the George Belsey Co., Los Angeles, Southern California General Electric distributor, it was stated that one of the ways in which the company had obtained "plus" business was "by helping the buyer to get a new FHA loan to pay off an old loan, say on a refrigerator already installed, and taking out a new loan to cover the purchase of an electric range, or vice versa."

Arthur Walsh, FHA Deputy Administrator, has called our attention to the fact that the statement that the proceeds of an insured loan may be used to pay up a prior obligation is incorrect. This situation is covered by Regulation No. 7, Question and Answer 7A, of the FHA booklet issued July 15, which is as follows:

"Q. Will notes executed for the purpose of financing eligible projects already begun, but not yet completed, be eligible for insurance?"

"A. Section 2 of Title I of the National Housing Act is designed to stimulate new activity in improving real property, and is not intended as a means of liquidating obligations previously incurred without reliance upon the credit facilities offered under Title I of the National Housing Act. Furthermore, the Administration will not insure advances of credit for the purpose of financing projects contracted for prior to Aug. 1, 1934, where the advance of credit is \$2,000 or less, or prior to May 29, 1935, where the advance of credit exceeds \$2,000."

"Complete Control.."

FOR COMMERCIAL REFRIGERATION UNDER ONE NAMEPLATE and that's SQUARE D

REGULATOR 9100-BPK3—Regulator (pressure) with Overload Protection and with High Pressure cutout. The Overload Feature includes manual on and off and external reset; is trip free and indicating. Screwdriver (or knob) adjustment of range and differential, both indicating. Steel conduit flange. **SQUARE D** provides in one compact controller, all the features necessary to meet today's requirements in commercial refrigeration motor control.

Rating—A. C., 1 H. P. 110/220 V., 5 Amps 550 V.—D. C., ½ H. P., 115/230 V.

REGULATOR 9100-BP3—Regulator (pressure) without Overload but with High Pressure cutout. Screw driver adjustment, end conduit.

Rating—A. C., 1 H. P. 110/220 V., 5 Amps 550 V.—D. C., ½ H. P., 115/230 V.

REGULATOR 9100-BT3—Regulator (temperature) without Overload but with High Pressure cutout. Screw driver adjustment, end conduit.

Rating—A. C., 1 H. P. 110/220 V., 5 Amps 550 V.—D. C., ½ H. P., 115/230 V.

REGULATOR 9100-BTK3—Same as BT3 except with Overload Protection.

REGULATOR 9100-APK4—Regulator (pressure) with Overload Protection but without High Pressure cutout. Knob adjustment, bottom conduit.

Rating—A. C., 1 H. P. 110/220 V., 5 Amps 550 V.—D. C., ½ H. P., 115/230 V.

REGULATOR 9100-AP4—Regulator (pressure) without Overload Protection and without High Pressure cutout. Knob adjustment, end conduit.

Rating—A. C., 1 H. P. 110/220 V., 5 Amps 550 V.—D. C., ½ H. P., 115/230 V.

"UNIFIED CONTROL"—"Unified Control" for refrigeration consisting of a standard motor starter in conjunction with the proper 9100 Regulator, mounted in one cabinet and wired ready for mounting on the compressor or nearby panel.

—Or if required by conditions of the installation, **SQUARE D** can furnish separately both the motor starter and 9100 Regulator for individual mounting.

SAFETY SWITCH—And under the same name plate, a **SQUARE D** fused or unfused safety switch can be supplied to meet approved disconnect requirements.

SQUARE D Regulator cases are brown bakelite, with two-tone adjusting knobs. Where the knobs are omitted, screw-driver adjustment is furnished. A single pole magnet structure provides quick make and quick break. The conduit flange is steel, choice of end or bottom. All metal parts are cadmium plated and blend with the brown case, presenting a smart, modern appearance, in step with today's trend and demand in machine design

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SQUARE D COMPANY

REGULATOR DIVISION, DETROIT, MICHIGAN

SQUARE D COMPANY, INC., LOS ANGELES, CALIFORNIA
SQUARE D COMPANY, CANADA, LTD., TORONTO, ONTARIO

Refrigeration manufacturers, distributors and dealers are invited to write for further details of "Complete Motor Control" for commercial refrigeration —by **SQUARE D**

COMMERCIAL REFRIGERATION

Coyle Describes Market for Commercial Units in Food Storage & Transportation

WILMINGTON, Del.—Thomas Coyle of the R. & H. Chemicals Department of E. I. du Pont de Nemours & Co., Inc., reviews the past history of commercial refrigeration and takes a peek into the future of the industry in an article in the current issue of the *DuPont Magazine*.

Major markets for commercial refrigeration equipment in the future, thinks Mr. Coyle, will be for food storage and food transportation, and as an aid in the distribution of frozen foods. Water coolers, he writes, may become a market of increasing importance.

"The industrial field offers a broad range of applications, and to date it is relatively undeveloped," he says.

"Mechanical refrigeration divides itself into four general classifications, based on the purpose of the installation and the type of equipment employed.

"First, there is the household unit for storing and preserving foodstuffs in the home. Second, there is the use of equipment for cooling and conditioning air for personal comfort as well as to secure desired results in a number of manufacturing and processing industries.

"The third type, industrial refrigeration, embraces equipment of large capacity for use in such operations as ice manufacture, brewing, and food processing.

"Fourth, there is the class of relatively small, automatic units used for various purposes in offices, stores, transportation equipment, and industrial plants."

It is to this so-called commercial group that Mr. Coyle particularly directs attention.

Commercial mechanical refrigerators, like Topsy, "just grew up," he says. "For a number of years many of these units were special jobs; that is, built specially for a particular installation. Naturally, at that time, they were subordinated to the more popular and rapid-selling household refrigerators, which were manufactured on a mass-production basis.

"Today, commercial refrigeration is receiving more serious attention in the trade. Many manufacturers have standardized their lines, at least in the small-unit class. This permits lower cost and simplified selling and servicing.

"Since 1925, approximately 1,000,000 of these units have been sold in this country. This compares with about 7,000,000 household units. But whereas the refrigeration capacity of the last-named type is in the neighborhood of 1/15 of a ton, that of commercial units ranges roughly from 1/4 of a ton to 20 tons. A ton of refrigeration is equivalent to the cooling effect secured by 1 ton of ice melting per 24 hours.

"The automatic commercial units are rapidly becoming standardized. Currently, beverage coolers and water coolers are quite popular and are being installed at a rapid rate. Such units have a relatively small refrigeration system. Their present popularity may be attributed, at least in part,

to the attractive designs now offered, and to the fact that units can be purchased from many retailers, at a relatively low price.

"The refrigeration of trucks designed for the transportation of ice cream, frozen foods, and other foodstuffs is now a well-established practice," Mr. Coyle writes. "Commercial systems are rapidly coming into use in this field. Another important outlet for them is in connection with the storage of furs and flowers, where a uniform low temperature must be maintained.

"Aside from storage, commercial units also find use in the preparation of foodstuffs. In the manufacture of ice cream, for example, both small and normal-sized freezers are now mechanically refrigerated. Commercial systems are employed in conjunction with some bread-wrapping machinery, to cool wax wrappers after they have been sealed by heat. Freshly-made candy also is quickly cooled the same way.

"But these systems are by no means limited to preserving and preparing foodstuffs. In industry, they find use for such purposes as cooling hot gases and air in heat-treating operations; also for testing brake blocks for structural strength at low temperatures and for making low-temperature tests on oils.

"Certainly their range of applications is almost unlimited. The compactness and efficiency of present-day systems gives them a wider scope than others have previously enjoyed.

"Approximately 80 per cent of the manufacturers of commercial systems are now using for all or part of their lines, the refrigerant, methyl chloride," Mr. Coyle claims.

DuPont's Cavalcade to Tell Little-Known Tales

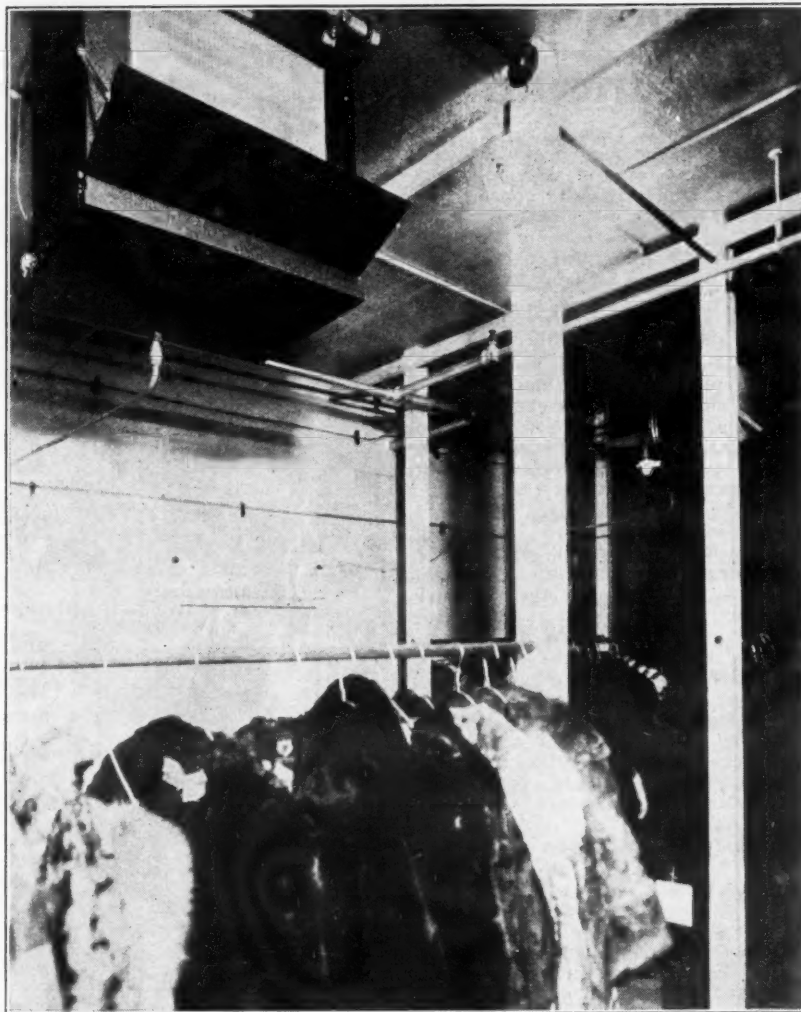
WILMINGTON, Del.—"The Cavalcade of America," half-hour radio program sponsored by E. I. du Pont de Nemours Co., Inc., goes on the air at 8:30 p. m. E.S.T., tonight, over a coast-to-coast network of the Columbia Broadcasting System. The program will be heard every Wednesday.

Linking together the little-known but thrilling episodes of American life, the program will carry advertising messages in line with the du Pont slogan, "Better Things for Better Living . . . Through Chemistry."

The company is also running a series of advertisements currently in *Saturday Evening Post*, dramatizing the contributions of chemistry to everyday life, and designed to increase the public's appreciation of the important, though little-known, part which chemistry and chemical discoveries play in the routine of living.

Du Pont products mentioned in *Post* advertisements include Duco auto polish, rayon, movie film, rubber products, including toys, Cel-O-Glas, wood cement, enamel, knitting needles, and insecticides.

Freezes Out 'Moth Trouble'



Memphis Steam Laundry-Cleaner has overcome the moth problem in clothes storage by installing a Frigidaire-equipped "freezer" room.

'Moth Trouble' Overcome by Storage Firm With Refrigeration Installation

MEMPHIS, Tenn.—The Memphis Steam Laundry-Cleaner, 53-year-old concern here, which recently entered the garment storage field, is taking care of "moth trouble," biggest problem in the garment storage business, by specially constructed vaults, designed and refrigerated by Frigidaire Corp. engineers.

The storage space constructed is of the "room-within-a-room" design. The larger, or main storage room, for normal storage of garments, is 26 ft. x 29 ft. x 12 ft. Standard fur storage temperature of 40° F. is maintained here.

The small room within the storage room, known to the trade as the "freezing room," is 3 ft. x 6 ft. x 8 ft. Temperatures of 15° F. or under are maintained in this room.

Destruction of moths is accomplished by sudden temperature changes rather than by continuous exposure to lower temperatures. Held in temperatures of 40°, moths are dormant, but may become active again when restored to the owner, unless subjected to the freezing process. Garments are taken from the 40° F. surroundings and placed in the freezing room at intervals of several days, so that any moths that may have been attached will die.

Each storage room is equipped with its own complete refrigeration sys-

tem, and each system is entirely independent of the other. The main storage room contains two cold air diffusion units, consisting of refrigeration coils housed in metal cases, and equipped with electrically driven fans for forcing the cold air equally throughout the area served. Units receive refrigeration power from a large compressor unit located outside the room.

Because the freezing room is smaller than the outside cold room, different equipment is used. Instead of forced air units, the cold comes from 195 ft. of pipe, coiled along one wall.

The coil is connected to an independent compressor outside both storage rooms.

Heavy insulation was used in this installation because of the amount of heat encountered in a standard commercial laundry. Side walls of the outside storage room were insulated with 6 in. of cork, while the floor and ceiling contain 4 in. each.

Less insulation—3 in. in walls and ceiling—is used in the freezing room, because it is within the other cold room and is surrounded with less heat.

Approximate costs for the system are as follows:

Cost of all material and labor for construction of storage room and freezing room, all Frigidaire equipment, installed and ready to use—\$3,000.00.

Average monthly cost to Sept. 1 of compressor water and electricity—\$8.50.

From these figures other costs, such as interest and depreciation, may be calculated.

34 Graduates Study At York's School

YORK, Pa.—The twenty-second annual factory sales course conducted by York Ice Machinery Corp. at its home plant here, opened last week for 34 "students," selected last spring from 24 leading colleges throughout the country. This is the largest class in the company's history, reports General Sales Manager S. E. Lauer.

The training course, of three months' duration, will apply principally to air conditioning and refrigeration in its technical aspects, after which the men will return to York branch offices, where they had previously been stationed to obtain field experience, to engage in actual selling.

Selection of the college graduates was in accordance with York policy for the past several years of obtaining top ranking students for leading engineering and technical institutions, and training them in the sale and application of refrigeration and air-conditioning equipment. Basis of the selection was nation-wide.

While at the York plant, the students are housed by the company in its Yorkco Club, and throughout the training period are paid a monthly salary by York.

During the 22 years in which the training course has been given, it has been completed by more than 250 students, Mr. Lauer says.

Empire Milk Coolers Use Circulating Pump

ROCHESTER, N. Y.—A circulating pump, operated by an independent switch, is featured in the new model electric milk cooler, manufactured by the Empire Milking Machine, Inc. here. Cold water pushed through the cabinet by the pump brings the milk temperature down to below 50° in 45 minutes.

Empire milk-cooling cabinets are complete with refrigeration unit and circulating pump mounted on the deck with cooling coil suspended underneath ready for operation. Water bath temperature is thermostatically controlled. Cabinet walls inside and out are made of heavy copper bearing metal, galvanized, and are heavily insulated.

"There has been a great increase in the sale of farm milk-cooling equipment this past season, particularly in the New England states," claims J. F. Waller, president of the Empire company.

"Boston apparently is a little further advanced than most milk centers in that they insist on milk being cooled to below 50° within two hours after milking or they will not allow the milk to be shipped to any of the creameries. This," he concludes, "has resulted in an enormous amount of coolers going into Vermont, New Hampshire, Massachusetts, and Rhode Island."

Another probable aid in increasing the sales of milk coolers is the traveling trailer, equipped by Empire Milking Machine, Inc., with a set-up of milking machines and a milk-cooling unit, now on tour of the country.

Water Wheel Operates Lipman Compressor

ATLIN, British Columbia—What amounts to just about the height of ingenuity in operating a mechanical refrigeration compressor is reported by C. A. Howse, Lipman representative in the Vancouver territory. The installation is in Atlin, just 10 miles south of Alaska.

Here, the owner of a Lipman model 50-G compressor runs his unit with a water wheel. When he wants peak load refrigeration, he pulls a rope, which lets more water pour over the wheel, speeding up the compressor.

"AN OLD NAME IN A YOUNG INDUSTRY"

CURTIS

A Complete Line—59 Units

Fair Policy—81 Years' Successful Merchandising

Quality Workmanship—41 Years' Building Compressors

Financial Stability—AAA Highest Capital & Credit Rating

Proven Design—13 Years' Building Refrigeration Units

Only by Building Permanently on This Complete Combination Can You Secure Sure Profits in This Fast Growing Industry—



← Air View of Curtis 20 Acre Plant

Curtis is a well integrated institution, having its own gray iron foundry, brass foundry, machine shop, pattern shop, tool room, electric welding department, structural shop and power plant.

CURTIS REFRIGERATING MACHINE CO.

Division of Curtis Manufacturing Co.
1912 KIENLEN AVENUE • ST. LOUIS, MISSOURI

Notice to Advertisers—

OCTOBER 16

issue of the News will feature
CABINETS & CABINET PARTS

If you have a sales appeal for your products which is worth while to the industry in planning sources of supply for next year, reserve your advertising space by telegram. Copy should be in our hands by Saturday, Oct. 12, to allow time for returning proofs for correction. We can handle a plate as late as Monday, the 14th, however, if we know that it is coming.

Brewer in Signed Article Lays Most of Dispensers' Troubles to Improper Cooling

CHICAGO—Chief problem in beer dispensing today, and one that is giving brewers one of their biggest headaches, is the complaint that beer is "too lively" or "too flat," and these complaints are due to the failure of the dispenser to properly refrigerate the beer, declares William F. Traudt, president of the Taber Organization, in an article in the September issue of the *Brewers Journal*.

"The uniformity with which beer is finished in the brewery and the excellent account it gives for itself when dispensed in the brewery tap room proves beyond a doubt that such complaints as might be received from a customer must be corrected by the customer on his premises and he in turn must heed the suggestions and cooperation of the brewery," Mr. Traudt states.

"The major cause of such complaints of 'too lively' or 'flat beer' is that the beer which shows a perfect sample at the rack at a temperature of 32-34° F. and has a gas content equivalent to approximately 4-5 lbs. bunging pressure, is too frequently placed in the warm basement of the dispenser where the temperature may be from 70-80° F., with the result that the beer in the barrel may get so warm that the internal pressure may reach upward to 40-50 lbs. per sq. in."

It is obvious, Mr. Traudt points out, that the beer then exhausts itself partly of its own combined gas at such high temperature in forcing the beer out of the barrel; therefore, the first half may run "too wild" and the second half too flat.

"It is further evident," asserts Mr. Traudt, "that any counter-pressure is ineffective until a substantial portion of the beer has been forced out by its own gas, and later when the usual counter-pressure does become effective the damage is already done and the beer draws with insufficient head."

"Such inconsistent handling of a perishable beverage like beer is not conducive to satisfactory drawing of an attractive glass of beer by a dispenser."

"It is reasonable to suppose," he says, "that the time is not far distant when dispensers of beer will again keep the package refrigerated as was the general practice in pre-prohibition days."

"The manufacturers of refrigeration equipment could do much to encourage such installations. A butcher or delicatessen or poultry dealer would not think of staying in business without a suitable refrigerator for his perishable product, so why should a beer dispenser expect to obtain the desired results without similar means of protecting the perishable product, beer?"

Milwaukee Store Buys Fedders & Lipman Equipped Case

MILWAUKEE—The Capitol Food Market, one of Milwaukee's largest downtown food stores, has recently installed a Fedders-equipped refrigerated meat display case, operating from a Lipman machine and maintaining a constant temperature of 38° F., to protect the meats and dairy products which it sells.

Display case used is a Federalbilt, and was sold by Federal Store Equipment Co., Milwaukee manufacturer of display cases and store fixtures. John Romadka is sales manager of the organization.

Fedders flat fin non-frost evaporators are located in the top of the case and below the shelf. Top coils are 2½x7½x128 in., and the lower coils 1½x15x128 in. Both are equipped with Fedders model 33 thermostatic expansion valves.



Ask to see Miller's Blueprint Service on RUBBER PARTS

WHENEVER you have a problem that has anything to do with rubber—remember that you are free to consult Miller engineers without any obligation whatever.

Since this industry was in the blueprint stage Miller has tackled and solved its rubber problems. Filling exacting requirements is our daily routine. An experienced technical staff divides among its members responsibility for rubber parts of practically every leading make of refrigerator.

Compounds which eliminate odor, avoid checking and cracking, retain their "spring", resist deteriorating action of butter, grease, mayonnaise. Our blueprints cannot fail to interest and help the production engineer. Yours for the asking. Just write. Miller Rubber Products Co., Inc., Akron, Ohio.

IF WE HAVEN'T
THE ANSWER—
WE'LL FIND IT!

Miller

The Fedders low side unit is connected to a Lipman condensing unit, located in the basement of the store. Methyl chloride is used as the refrigerant, and the entire installation is balanced as to output and current economy.

Refrigerating unit is a two-cylinder, 2-hp., Lipman model 203, with water-cooled condenser. The complete high side is located on a sturdy base, and supplies refrigeration for two 12-ft. meat display cases, a 4-ft. fish counter, an 8-ft. delicatessen counter, and two large coolers.

Trailer Kept at 28 to 33° Temperature on Desert & Mountain Trips

WICHITA, Kan.—Through desert heat in summer and mountain cold in winter, temperatures of 28 to 33° are maintained in the semi-trailer operated by the Red Arrow Transport which hauls 15 tons of meat from Wichita to the Pacific Coast and carries fruits on the return trip.

Temperatures are maintained by means of a McKenzie forced-draft brine cooling system. The body is insulated with 5 in. of Dry Zero in the roof, 4 in. of the same material in sides and ends, and 3 in. of cork in the floor. The trailer—24 ft. x 7 ft. 3 in. x 7 ft.—weighs only 5,210 lbs.

Large Storage Section Features New Russ Rapid Freezer

CLEVELAND—Latest addition to the Russ line of counter freezers is the model 260-SC Russ rapid ice cream freezer, designed to meet the demands of retailers who need a greater hardening capacity than that offered by the conventional counter freezer unit.

All Russ features, such as the horizontal freezer, floating dasher, back-throat intake, flooded-brine type system, all steel construction, and precision manufacture, are included in the new model.

Hardening section of the unit will hold 60 gallons of bulk ice cream, and from 65 to 80 gallons in brick or package. The mix storage compartment has a capacity of 20 gallons.

Both compartments are easily accessible through black, piano-hinged, molded semi-hard rubber covers. The unit is well insulated throughout for economy of operation. The model may be equipped for either self-contained or remote compressor installation.

Bottle Coolers & Radios Shown Crosley Dealers

SAGINAW, Mich.—W. W. Carroll, district manager, presented the 1936 radios, the new "super freezer" model, and Koldrink bottle coolers to 75 dealers at a special showing held recently by the Saginaw Hardware Co., Crosley distributor here.

C. W. Steltzriede, manager of radio and refrigeration sales for the distributing company, was in charge of the meeting.

Lansing Distributor for Lipman Appointed

LANSING, Mich.—The McCarty Sales & Service Co. here has been appointed distributor for Lipman equipment, manufactured by General Refrigeration Sales Co., Beloit, Wis.

New FHA Booklet Tells How Retail Stores May Get Loans for Improvements

WASHINGTON, D. C.—In a booklet just issued, titled "Loans up to \$50,000," the Federal Housing Administration informs merchants, manufacturers, and all owners of business property of the possibilities for modernization for profit offered them through this government agency.

In the foreword of the booklet, Federal Housing Administrator Stewart McDonald stresses the need, in many business places, for modernization, to keep pace with changing production and merchandising methods, and urges merchants and industrialists to take advantage of the liberal FHA loan policy.

Illustrations depict various types of buildings before and after modernization.

A portion of the booklet, devoted to "Answers to Your Questions," outlines the system by which this type of loan may be obtained. Some typical questions and answers are:

Q. Who may secure government-insured credit?

A. Any property owner or lessee... interested in improving a property or plant, and whose income, prospects, and credit record are such as to meet the requirements of the approved lending institution which is asked to grant the loan. These are not government loans, but private loans, insured by the government.

Q. How much may be borrowed?

A. I. Any amount up to \$2,000 for the improvement of any type of property.

II. Any amount up to \$50,000 for the improvement of special types of property, such as apartment houses, multiple-family houses, hotels, office buildings, retail stores, barber and beauty shops, restaurants, etc.

III. The lending institution will in

each case determine how much it cares to lend, within the above limitations.

Q. How must this loan be repaid?

A. In equal monthly instalments over periods up to five years. The length of time... is entirely at the discretion of the lending institution.

Q. What may loans up to \$50,000 cover?

A. Conversion of other buildings into, or the improvement of existing apartments, multiple-family houses, hotels; office, business, or commercial buildings; hospitals, orphanages, colleges, schools, and manufacturing and industrial plants, and the purchase and installation of eligible equipment or machinery, with or without any structural changes in the building. This means that either part or all of the loan may be applied either to alterations and structural improvements, or to the purchase of eligible equipment and machinery.

Q. What may loans up to \$2,000 cover?

A. In respect of buildings listed in preceding answer, loans may be made for identical purposes. In addition, all other types of buildings, such as single-family dwellings, churches, clubs, and farm properties, may be altered, repaired, and improved in accordance with the original Modernization Credit Plan... but in conformity with the present amended plan.

Q. What are the credit qualifications of a borrower?

A. A statement satisfactory to the lender, which shows the borrower to be solvent, with reasonable ability to pay the obligation as agreed, with debts, attachments, and mortgages on the property in such standing as shall be acceptable under the credit policy

of the lending institution. Each case will be judged on its merits by the lender.

Q. Is the borrower restricted regarding materials?

A. No. He may exercise his own choice and judgment.

Q. What machinery and equipment is eligible?

A. A leaflet (FHA 145) fully describing the qualifications for eligibility and listing a large number of eligible items will be mailed upon application. Lending institutions have copies on file.

Zamoiski Subsidiary Handles Commercial

BALTIMORE—New subsidiary of the Joseph M. Zamoiski Co., local Norge distributor, is the Norge Engineering Corp. of Maryland, organized to retail commercial refrigeration, oil burner, and air-conditioning operations, as regular dealer set-ups are usually not equipped to take care of technical phases of such applications.

Myron Oppenheimer, manager of the new organization, has a staff of men specially trained for this type of specialty merchandising. Headquarters of the new company adjoin those of the Joseph M. Zamoiski Co.

2 New Distributors Named By Allied Store

ST. LOUIS—Allied Store Utilities Co. here, manufacturer of Hussmann-Ligonier commercial refrigerators, has appointed two new distributors—Cochran & St. John, Ltd., San Francisco, distributor for northern California, and Cable-Wiedemer, Inc., Rochester, N. Y., distributor for the Rochester territory.

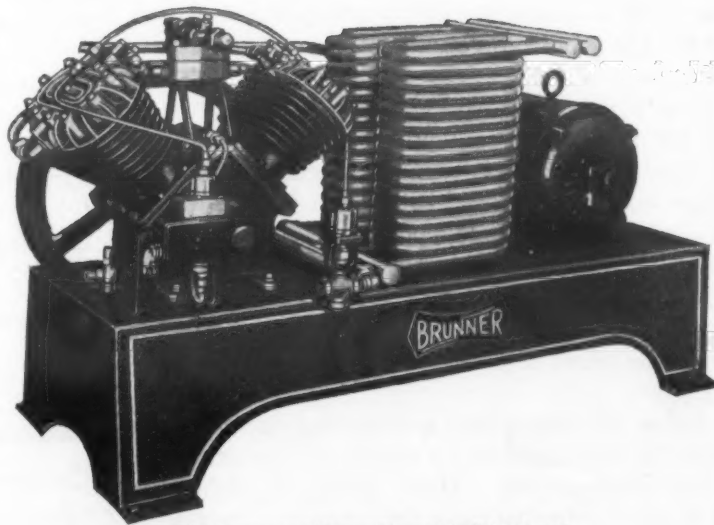
The STAMINA of a Bear



The ability to keep tirelessly forging ahead... fighting obstacles... coming out a winner. That's stamina. And for that Brunner Refrigeration Units are famous.

Take this Brunner Highside (right) as an example. Every detail of its construction spells "stamina". One look at the way it is built will convince you that here is no ordinary 3 H. P. unit but a highside built to oversize proportion to give the extra margin of performance that means real economy.

Get acquainted with this and the whole Brunner line—8 compressors and 41 highsides in a range from 1/6 H. P. to 15 H. P. for every commercial requirement. A card to us today will bring your free copy of the Brunner Refrigeration Catalog. Brunner Manufacturing Co., Utica, N. Y., U. S. A.



The Brunner Heavy Duty Model W-300. Smooth... Rugged... Actually oversized for prolonged, heavy-duty wear... 3 H. P.; water-cooled.

Brunner
A NAME BUILT BY 29 YEARS OF SERVICE

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Published Every Wednesday by
BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich. Telephone Columbia 4242.

Subscription Rates—U. S. and Possessions and all countries in the Pan-American Postal Union: \$3.00 per year; 2 years for \$5.00. Canada: \$6.00 per year (due to special tariff). All Other Countries: \$5.00 per year (U. S. Money). See "Buyers Guide" columns for combination rates with the 1935 Refrigeration Directory and Market Data Book. Notice: We employ no subscription solicitors. Pay no money to strangers claiming to represent this paper. Send orders and remittances by mail.

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VOL. 16, No. 6, SERIAL NO. 342, OCTOBER 9, 1935

Presenting a New Use For Chest Models

WHITE ELEPHANTS are embarrassing, to say nothing of being unprofitable, to have around. And for more than a year it appeared that the electric refrigeration industry was going to be forced to keep company with a white elephant of its own—the chest model refrigerator. But now, at long last, a demand for this 2-cu. ft. top-opening job has sprung up which is not only cleaning out old stocks, but is requiring manufacturers to go back into production on this item again.

Present-day purchasers of chest models are public utilities. That isn't surprising, for almost no other class of resale customers could be interested in the chest models. Profit margins on these midget boxes were too small to interest department stores or specialty selling organizations. Even utilities were stumped for awhile by the chest models, for they apparently left prospects "cold." In the Tennessee Valley, for which these boxes had been designed originally, thumbs down were turned on the chest models everywhere.

But certain public utilities have discovered that chest models can be rented in large numbers, and that in this capacity they serve as an excellent sales promotional medium. As a result, these central station merchandising departments are buying chest models in lots of a thousand or more—a practice which just suits the manufacturers, for they hadn't made any money out of chest models, either, selling them two or three units at a time.

The procedure of renting chest models is simply this: an emissary from the public utility—possibly the meter reader or bill collector, or sometimes a canvasser hired and trained especially for the job—calls on a customer of the utility and tells about these new, small electric refrigerators which the central station is willing to rent for \$1.00 (in some places, \$1.50 and \$2.00) per month. The canvasser suggests that the utility customer allow this refrigerator to be installed in his home, pointing out that the combined rent and operating costs will be considerably less than ice bills. General practice is to have these canvassers call only on customers whose electrical bills are in the lowest classification.

A few utilities which are renting chest models allow the rent money to apply on the purchase of the refrigerator. Most, however, refuse to sell it, preferring to turn the names of prospects obtained in this manner over to local dealers in the hope that the latter can sell them larger boxes. Once a family gets accustomed to the convenience of electric refrigeration in their home, of course, it becomes no trick at all to sell them a full-sized refrigerator on the easy terms which are available today. Some utilities expedite this procedure by putting a time limit on the length of time they will rent a chest model to any particular home; i. e., after a rental period of, say, nine months, the chest is removed from the premises.

So long as this practice is confined to wired homes in the lowest income brackets—homes

which normally would be considered poor prospects for dealers and salesmen—it would seem that it should be a commendable one. When families which have previously believed that electric refrigeration was simply out of the question on their limited budgets see for themselves how little it costs, they then become ripe prospects for salesmen and dealers. The utilities boost the load on their lines, the dealers increase their volume, the customers step up their scale of living, and everyone is happy. It looks like a good idea.

It's Hot and Humid All the Time in Sourabaya, Java

JAVA offers a real market for air-conditioning equipment, as well as household and commercial electric refrigeration, according to T. P. Timmerman of the General Netherland-Indies Electrical Co., Sourabaya, Java. The temperature remains practically constant between 85 and 90° F. the year 'round and the humidity runs as high as 90 per cent nearly every day of the year.

Mr. Timmerman recently visited the NEWS offices during a short stay in Detroit on his trip around the world. He had left Java some three months before and had visited San Francisco and Chicago before reaching Detroit. He was actively seeking sources of supply for refrigeration and air-conditioning equipment.

Mr. Timmerman, a native of Holland, has been in Java for about five years which is normally considered the limit for Europeans to stay in the equatorial climate of Java. A very rugged looking citizen, he shows no ill effects and, furthermore, gave no indication of his intention to relinquish his position. Apparently, air conditioning is the answer to the white man's problem in the Torrid Zone.

According to Mr. Timmerman, he had learned everything he knew about air conditioning from reading ELECTRIC REFRIGERATION NEWS. With due allowances for native diplomacy, his conversation indicated that he had read about everything which the NEWS has printed about air conditioning. But in addition to a complete familiarity with trade names and types of equipment made in this country, Mr. Timmerman revealed that he also had first-hand knowledge about the relative merits and prices of similar appliances made in Europe.

From one or two comments about his present sources of supply, we gathered the impression that European manufacturers are a step ahead of the U. S. on at least one major appliance (we'll not mention it just now except to say that it is not the electric refrigerator).

On page 9 of this issue is published an interesting and informative survey of electric refrigeration activities in the Panama Canal Zone. The refrigeration industry seems to be branching out this year as never before, carrying its gospel of good health through properly preserved food and properly conditioned air to the proverbial four corners of the globe. And as announced last week, the editor of ELECTRIC REFRIGERATION NEWS is preparing to embark on an around-the-world survey of refrigeration, air conditioning, and electrical appliance markets for the benefit of readers of the NEWS. Having taken the United States by storm, refrigeration is going international; and the NEWS intends to report the progress of this movement in detail.

WHAT OTHERS SAY

Summer Cooling Need Not Be Expensive

THIRD season operating results from the cooled residence at Birmingham, Mich., equipped by Detroit Edison for test purposes, are now available. They permit comparisons to be drawn between the results and the costs of using ice or electric refrigeration. Ice shows up rather badly in the comparison.

To some this may be the point of most interest. To most people, however, the really interesting information is that a 2-ton refrigerating machine supplying cooling to an eight-room house of 19,000 cu. ft. would operate through a summer as severe as that of 1934 at Detroit at a cost of only slightly more than \$19.

The house was well constructed and insulated to be sure, and also Detroit summers are not comparable in severity to those found in many other localities. Even if we make all due allowances, however, it seems apparent that there are many houses in the north where operating costs for the summer season need not exceed \$50. There are also thousands of families well able to afford such an expenditure.—Heating and Ventilating.

LETTERS

Not Electrolux

Servel, Inc.
Evansville, Ind.
New York Office, 51 East 42nd St.

Editor:
In the Sept. 25 issue of ELECTRIC REFRIGERATION NEWS, on page 3, there is a short item headed "Data on Operating Costs of Kerosene Units Is Collected."

It has come to my attention through several sources that reference is made in the first paragraph to "Kerosene burning household electric refrigerators" and the writers have questioned whether or not this could in any way be confused with kerosene burning household Electrolux refrigerators.

The particular refrigerator in question operates on a somewhat different principle than Electrolux, and I feel that there is very little likelihood of confusion occurring. However, I presume that you desire to have such things called to your attention even though they may appear to be relatively unimportant.

While writing I wish to take this opportunity to express my appreciation of ELECTRIC REFRIGERATION NEWS. It has certainly been very valuable to me.

WM. R. HAINSWORTH,
Vice President
In Charge of Engineering.

Why A.B.C. Circulation Data Is Insufficient

Wagner Electric Corp.
6400 Plymouth Ave., St. Louis
Publisher:

You asked Mr. Cohenour why leading manufacturers voice their confidence in the Audit Bureau of Circulations, and yet at the same time ask for additional circulation information.

The fact that you have your circulation audited is assurance to us advertisers that you are on the honest side of the publishing business—that you do not hesitate to have a "detective" come into your office and audit your circulation to see whether you really mail out as many copies as you claim to, and that they really are paid for and that they really are the type of readers you claim them to be.

Although many publishers not thus audited are carrying a large volume of advertising, the day will unquestionably come when they will be more and more on the defensive as to why they are not willing to have their circulation audited. When the day arrives that the majority of publishers of your caliber belong to the A.B.C. (or the C.C.A.), the outsiders will be hard put for an acceptable answer as to why they do not risk an audit. I personally hope that that day will soon be here, for the sake of the advertiser and the honest publisher.

But the A.B.C. deals only in figures. We still do not know whether a circulation of 500 in Illinois covers the industry within the state in proportion to its location or is concentrated in one city like Chicago—completely ignoring worthwhile plants in other parts of the state. That is why I have in the past demanded county breakdowns.

Nor do mere figures tell me what percentage of a magazine's circulation is of value to Wagner from the Wagner standpoint. For example, in the automotive field we are trying to reach garages doing actual repair work on brakes and clutches. If two magazines have equal circulation, I find it difficult to determine which one is of more value to Wagner—but if I can analyze their circulations to determine what percentage of each circulation reaches the type of repair shop Wagner sells to, then I can determine which one should carry the greater part of our advertising.

The circulation of air conditioning and refrigeration papers, for example, can be broken into dealers doing no service work, and dealers doing service work. In fact, at this time we do not know just what we intend to discover—but when we have actual names to analyze, we will discover some facts which will help us in placing our advertising.

I recently made a survey of the circulation of six automotive circulations in towns A to H in Indiana, I to M in Illinois, etc., and discovered circulation facts the publishers themselves did not know existed.

As a result, one publisher has completely overhauled his circulation department as he discovered that 30 per cent of the circulation was duplications and readers not in the repair business. Similarly another publisher discovered that he was reaching only one-third of a certain classification, whereas he had always advertised that he reached almost all companies in that classification.

We swear by the Audit Bureau of Circulations, but we also find it necessary to have additional information.

C. B. DIETRICH,
Advertising Manager.

Annual Headline Boner

Norton, Va.

Editor:
Subsidized? Oh, no!
Even when 10 Norges are installed you can't keep G-E out of your brain, eh?

A. C. McCLEURE.

Editor's Note: Mr. McClure's outburst was accompanied by a clipping of a story from page 13 of the Sept. 25 issue, telling about the installation of 10 Norge electric refrigerators in a Salinas, Calif., apartment house, but which was headlined "10 G-E's Installed in New Apartment Building."

Our apologies to Norge Dealer Breschini, who made the installation, and our thanks to Thorough-Reader McClure for calling this error to our attention.

Somehow, though, we feel kind of relieved, now that the tension has gone, and we've made our annual Headline Boner. Like the case of an infelder who has run a string of errorless games to 40 or more, the strain was becoming terrific.

These "boners" even themselves up more or less as far as individual companies are concerned. Old subscribers will remember the time Columnist O. O. McIntyre installed a G-E in his apartment and we headlined the story "O. O. McIntyre Buys a Frigidaire." Cries of "subsidized by Frigidaire" arose from G-E dealers all over the country.

Just as every dog is allowed one good bite, so every headline writer is allowed one good "boner." Otherwise, the strain will get him to the point where he will be standing himself up in the corner and putting his umbrella to bed, or scratching his pan-pakes and pouring syrup down his back.

If J. H. P. Were Alive

Westinghouse Electric & Mfg. Co.
200 East Fifth St., Mansfield, Ohio
Editor:

I wish John Patterson were alive today to read your story of his life. From his intimate knowledge of his own life, he might report that history missed a few facts and details, but I am sure in your work he would recognize the spirit of the things he was trying to do.

I started the first instalments because I think every man interested in sales work is interested in John Patterson. With succeeding instalments my pleasure grew. As the story went on my attitude changed again. I found that you had so captured the spirit of Mr. Patterson's efforts that I was actually getting, not only sales inspiration, but actual sales ideas from your story.

Personally, I think every sales manager in America should read your serial.

VERNON E. VINING,
Director, Department Store Sales.

Information Not Obtainable Elsewhere

Route No. 11, Box 545
Dayton, Ohio

Editor:
I am not connected in any way with the refrigeration or air-conditioning business but I hope to be some day, as I am a student enrolled with the Refrigeration & Air Conditioning Institute of Chicago. I have received your excellent paper for the past six months and I want to express my appreciation of it.

To me it has been a source of knowledge not obtainable elsewhere and it has been an inspiration to me each week, enabling me to tackle my lessons with greater enthusiasm than I would have without your paper.

Yours is a worthy service to the entire refrigeration and air-conditioning business.

A. S. DEGLER.

Service Men Discuss News Over Jobber's Counter

Merchant & Evans Refrigeration Accessories Co.
Refrigeration and Oil Burner Supplies
2035 Washington Ave.
Philadelphia, Pa.

Publisher:
Great interest is manifested in ELECTRIC REFRIGERATION NEWS, and considerable discussion often ensues over the counter between service men coming for their supplies, over articles appearing in the NEWS. We have several issues in book form on our counter, and they are very much used there.

At your convenience you might give us a lineup for selling the NEWS. We might be able to get some business for you, and would be glad to be of any assistance to you.

J. SIMONS.

"Kindly send the seven issues which feature parts of refrigerators. Also bill and I'll send money. ELECTRIC REFRIGERATION NEWS is as good as a refrigeration course."—Johnny Lawrence, 27 Bedford Ave., Middletown, N. Y.

"I find the NEWS very essential in keeping me up to date in all things regarding electric refrigeration."—John H. Sackey, Refrigeration Technician, 1440 E. Losey St., Galesburg, Ill.

LETTERS

Any Connection With Service Society?

George Monjian Co.
Manufacturers & Distributor of
Refrigerator Accessories
360 East Grand Ave.
Chicago, Ill.

Publisher:

In reply to your letter of Sept. 25, regarding a meeting in Detroit Oct. 23.

I am very much interested in your proposition and will attend the meeting, however, I also received a letter from H. T. McDermott, national secretary of the independent service organization who are also forming an association for the jobbers. I would like to know whether or not this has any connection with yours.

GEORGE MONJIAN.

Answer: We have been informed regarding the letter which was mailed out by H. P. McDermott, national secretary of the independent service men's society, but we did not have this information until after our plans were made for the meeting.

The members of the committee here in Detroit have been conferring with us regarding the matter over a period of several months and we simply adopted the date of Oct. 23 because it appeared that this date would meet the convenience of jobbers who would be interested in attending the service men's meeting.

So far as ELECTRIC REFRIGERATION NEWS is concerned, we have no program for the jobbers association but we are simply lending our assistance in getting the group together as we have done on various other occasions in the past for other groups in the industry. In general, our attitude is to get the group together, give them a dinner, and then let nature take its course.

We simply provide the place of meeting and facilities for a congenial atmosphere. Usually, that is all that is necessary when a group of independent business men with common interests get together. Being substantial and experienced business men, they should have no difficulty in taking their affairs in hand and working out a plan to suit themselves.

The committee has not been informed as to just what Mr. McDermott has in mind. If the jobbers see fit to meet with him on Friday as proposed, it will be entirely agreeable to us. The committee here has no plan or program other than the dinner and social evening. Speaking for ELECTRIC REFRIGERATION NEWS, we have no official connection with any association.

Referring further to the dinner, in addition to the jobbers, we are inviting a large number of manufacturers and expect to have quite a party. If all, or any part, of the group want to get together for a business session, there will be facilities available. In any event, there will be no "steam rollers" on the premises.

More than One?

Square D Co.
Electrical Equipment
Regulator Division
6060 Rivard St., Detroit, Mich.

Publisher:

Thanks very much for your kind invitation to join the NEWS party Wednesday evening, Oct. 23. Does your letter and card mean that others from this organization may be present at the dinner meeting Oct. 23?

If this is true, there are three or four other persons in this division who would like to get this atmosphere. If there is any charge for the dinner, we would be glad to pay that. We are very anxious to meet with others in the refrigeration industry. Please advise if several of this division may attend the party.

Please advise me about the big party, as I want to make plans.

IVAN CORCORAN,
Regulator Division.

Answer: Other members of your organization will be most welcome. Manufacturers differ in their policy toward the new group of supply jobbers. Some are interested in developing jobber outlets and others are not. Since this will be the first meeting of its kind, no one has a complete list of jobbers, or of manufacturers who want to sell through jobbers. The dinner party has been planned just for the purpose of helping everybody to get better acquainted.

Also Valve Co.
2628 Big Bend Blvd., St. Louis, Mo.
Manufacturers Automatic Control
Devices for Refrigeration and
Air Conditioning

Publisher:

Mr. F. D. Turner and the writer will be more than pleased to accept your kind offer to attend the dinner meeting at the Hotel Wardell in your city on the date mentioned.

Thank you for your kind consideration.

J. L. SHRODE.

Sees Need for Standards

Pfaudler's Refrigerator Parts
333 Plymouth Ave., So.
Rochester, N. Y.

Publisher:

We wish to acknowledge receipt of your invitation for the meeting to be held Oct. 23. At this writing it does not look as though my partner and myself would be able to attend, but should things shape themselves favorably we will telegraph you at once.

We are delighted to note that you mention "standards of practice" as just at present jobbers and manufacturers are not working as closely as they should and there is considerable resultant confusion in the minds of the trade. We sincerely hope that you will be able to shape some such agreement as it will really work out to the mutual benefit of the manufacturer and jobber.

If there are minutes or reports available of this meeting we would appreciate a copy, even if there is a charge. We are keenly interested in this meeting and you may be sure if it is at all possible we will attend.

We cannot stress too strongly the need of agreement on prices and discounts extended to the trade as it is necessary we gain their respect and this can never be accomplished when the manufacturer is constantly trying to get the business direct without the aid of his jobber. This is not true of many companies, but some are practicing this "throat cutting" to their own detriment. We find the men are getting to a point where they are not interested in goods from these companies.

If we are not there we hope to hear from you. Our good wishes for a successful and pleasant meeting.

K. L. PFAUDLER.

Organization Needed

Forslund Pump & Machinery Co.
Refrigeration Supplies
3033 Main St., Kansas City, Mo.

Publisher:

The writer is pleased indeed to advise you that he will be on hand Oct. 23 to attend the meeting of refrigeration supply jobbers.

We are extremely anxious to see some sort of an organization started wherein the jobbers, as well as the manufacturers, can have some control over prices to refrigeration service men and distributors. Some steps should be taken immediately to prevent the refrigeration supply business getting into the deplorable condition as the radio parts business is now in.

We are looking forward to attending this meeting with a great deal of pleasure as we believe a great deal of good information can be obtained.

L. H. ROBERTS.

Reputation to Uphold?

Ansul Chemical Co.
Marinette, Wis.

Publisher:

Just a line to acknowledge receipt of your invitation to attend your banquet on Oct. 23. We will certainly be very glad to be with you on that occasion, as history shows that you are the acme of hosts.

H. V. HIGLEY,
Secretary.

Splendid Idea

Williams & Co., Inc.
Pittsburgh, Pa.

Editor:

The writer is planning to attend the Refrigeration Service Engineers Society's convention, and will also plan to be at the supply jobbers' dinner, meeting, and smoker, to be held at 6:00 p.m. Wednesday, Oct. 23.

We believe that this is a very splendid idea, and should be of material help in building up the standard of practice in connection with the sale of refrigeration supplies to the distributing and jobbing organizations.

H. S. McCLLOUD.

Coming from the Carolines

Home Appliance Service Co.
Refrigeration Supplies
714-716 West Market St.
Greensboro, N. C.

Publisher:

This will acknowledge receipt of your invitation to attend the dinner meeting of the refrigeration supply jobbers to be given at the Hotel Wardell in Detroit on Wednesday evening, Oct. 23.

In view of the fact that the writer anticipates attending the convention of the Refrigeration Service Engineers Society, he will be very pleased to attend the meeting which you have so kindly invited us to attend.

W. H. PARKER.

Century Electric Co.
Manufacturer of
Motors and Fans
Saint Louis, Mo.

Publisher:

I hope someday to be able to be in Detroit during one of your parties. I find it will be impossible to be there on Oct. 23, but I certainly appreciate your thinking of me and giving me the opportunity to join with you.

At my first opportunity, the first time I visit Detroit, I am going to see your new quarters.

OLIVER S. IMES,
Publicity Department.

They're Coming . . .

Fedders Mfg. Co.
Buffalo, N. Y.

Publisher:

The writer wishes to acknowledge your letter of Sept. 25 relative to the proposed meeting at Detroit on Oct. 23.

We plan to have representation at the convention of the Refrigeration Service Engineers Society and the writer will make it a point to be present at the meeting to which you refer.

H. E. RIECKELMAN,
Assistant to the President
in charge of sales.

Dole Refrigerating Machine Co.
663 Washington Blvd., Chicago

Publisher:

Thank you for your special invitation to join the party which you are giving to the Refrigeration Supply Jobbers on Wednesday evening, Oct. 23.

I will be there.

E. J. TWEED,
Treasurer and General Mgr.

Refrigeration Supplies Distributor
Division of The Starr Piano Co.
222 N. Vermont Ave.
Los Angeles, Calif.

Publisher:

The writer will be pleased to attend the dinner meeting of refrigeration supply jobbers at the Hotel Wardell in Detroit, Wednesday evening, Oct. 23.

RAY STRAHAN, Manager.

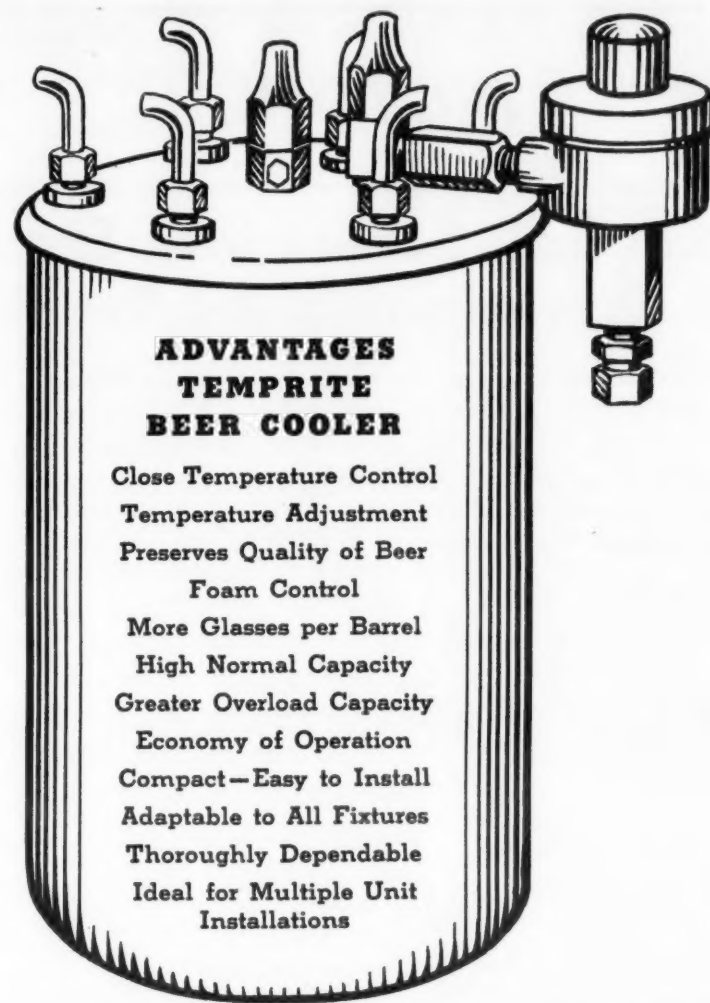
Young Supply Co.
1050 W. Baltimore Ave.
Detroit, Mich.

Publisher:

We wish to acknowledge with thanks your invitation to dinner extended to supply jobbers, to be held at the Hotel Wardell on Oct. 23.

The writer with Mr. Dave Bell will gladly attend.

L. M. YOUNG.



ADVANTAGES TEMPRITE BEER COOLER

Close Temperature Control
Temperature Adjustment
Preserves Quality of Beer
Foam Control
More Glasses per Barrel
High Normal Capacity
Greater Overload Capacity
Economy of Operation
Compact—Easy to Install
Adaptable to All Fixtures
Thoroughly Dependable
Ideal for Multiple Unit
Installations

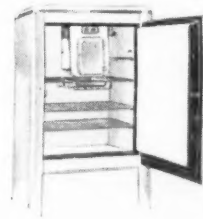
TEMPRITE PRODUCTS CORPORATION

1349 EAST MILWAUKEE AVE.

DETROIT, MICHIGAN

ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES

Introducing



A NEW REFRIGERATOR

which incorporates the latest tested refinements and conveniences . . . plus . . .

A New exclusive feature which greatly improves existing standards of electric refrigeration performance.

New Merchandise

... New Low Prices and ...

A New Policy of Direct Sales to Department Stores and the Trade.



UNIVERSAL COOLER CORPORATION

DETROIT, MICHIGAN

BRANTFORD, ONTARIO

Manufacturers of a Complete Line of Household and Commercial Refrigeration

MOTORS

Tatem Says Service Men Should Do Only Minor Motor Repairs

By Geo. C. Tatem, President, The Electric Refrigeration Motor Co., Inc.

DURING the past two years, fractional horsepower motor repair work has become a very highly specialized line. This fact is now recognized by practically all refrigeration distributors, dealers, independent service men, ice cream manufacturers, and all others who operate units with fractional horsepower motors. This is borne out by the policies of the majority of refrigeration distributors who, up to several years ago, maintained their own repair departments, but who have found that much of their motor repair work can be done by a company specializing in motor repair work, not only at a lower cost, but also more efficiently.

They now realize the false economy of making patch up repairs (installing one bearing when the motor needed two, being satisfied with parts which were partially worn, and etc.), which gave them approximately four or five months of service. While they saved a small amount of money on motor repairs, it was more than offset by the increase in their service calls, which naturally resulted in customer dissatisfaction, and in some cases even spoiled merchandise.

On the other hand, when a motor is sent to a reputable shop specializing in this particular line, the repair shop proprietor realizes that a one-year guarantee goes with every unit he handles, and out of necessity, the motor must be given a very thorough going over, with replacement of all necessary parts, and perhaps parts that are only slightly worn, in order to back up the guarantee of that particular shop.

As a whole, when a motor is received from a house specializing in fractional horsepower motor repair work, it is practically in the same condition as a new unit. The proof of this statement is the fact that motor difficulties encountered today, are not nearly as great as those encountered several years ago. This condition cannot only be laid at the door of the companies specializing in

motor repair work, but also to the education of service men and their better general knowledge of an electric motor.

Even today, motor failures could be considerably decreased by periodical inspections and proper fusing.

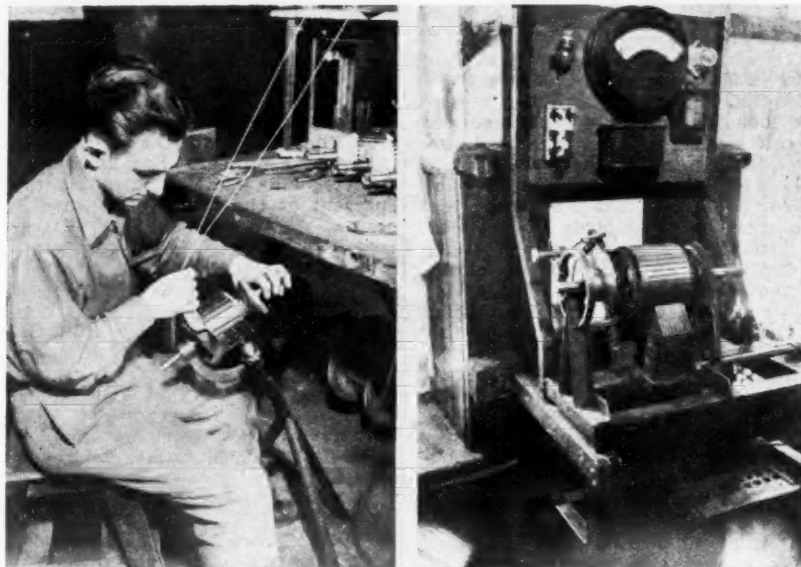
Periodical inspection is one system that could be adopted and used to a decided advantage by all service organizations, and if their men would live up to the common understanding that these inspections should be carried out at least twice a year, a decided saving could be effected. A motor would last a long time, barring unusual circumstances, if the dust and scum which accumulates during a period of time, was cleaned off, the motor properly oiled, and brushes properly seated.

The fusing of motors always was, and always will be a problem. Much has been written in an endeavor to impress upon every one who comes in contact with motors that it does not pay to over fuse any line.

Overfusing still accounts for a large number of motors failing in service, and usually when a motor fails from this cause, it is in such condition that it requires either partial or complete rebuilding.

Too many service men take it upon themselves to overfuse motors in order to eliminate call back service calls. This has been brought about to some degree, by the refrigeration industry itself, due to the fact that a large percentage of distributors and dealers pay their service men on a "per call" basis, and nothing on call backs; therefore in order to eliminate

Repairing Worn-Out Motors



Left—Workman winding armature, showing process of winding by needle which prevents crossing of wires. Right—Armature growler test, including commutator testing apparatus and moisture test.

any possible chance of a call back, at least insofar as the motor is concerned, the service man proceeds to overfuse the motor.

This is not only detrimental to the motor and the equipment it operates, but it is also dangerous, and has resulted in a number of fires, causing, if not loss of life, at least the destruction of property, to the extent of many thousands of dollars. If this condition is not corrected, it will some day reflect upon the refrigeration industry.

The extent of repairs attempted by service men in the field today, we believe, has been very much minimized. This also has been a step in the right direction, due to the fact that it is impossible for a service man to carry the proper equipment to test a motor after having made any repairs.

Outside repairs should be limited to such things as periodical inspection of motors, including cleaning of commutators with either a commutator stone, or a very fine grade of sandpaper (do not use emery paper), brushes cleaned, brushholders inspected and cleaned, seeing that brush is free in the brushholder, and that the brushes are properly seated.

If it is necessary to install new brushes, the service man should make

sure that they are sanded in and seated.

It is also important that a good grade of brush be used. Brush wear is often attributed to motor conditions or electrical problems, when in reality, it is an inferior brush.

When a service man checks a motor in the field, conditions such as the following may be encountered: excessive sparking when starting, and excessive brush wear. This can usually be attributed to a dirty or rough commutator, brushes being worn very short, brushes sticking in holders, high or low bars on commutator, high mica, overload, grounding, poor or wrong connections, voltage too high or too low, or a dirty short circuiting device.

Excessive heat can usually be attributed to an overload condition, shorted stator coil, poor or wrong connections, grounding, voltage too high or too low, or bent shaft because the armature rubs on the poles.

If the motor hums but won't start, this condition can usually be attributed to an overload, an open rotor coil, brushes either worn very short or stuck in brushholder, improper brush setting or wrong connections.

Rumbling and noise conditions have been very prevalent in electric refrigeration motors during the past several years, and can usually be attributed to too much end play; this is especially true of capacitor motors, and a good deal of this trouble can be eliminated by installing a sufficient number of thrust washers to take up the end play.

Failure of the motor to start is usually caused by brushes being stuck in the holder, very high mica, armature rubbing on pole pieces, short circuit in armature, grounding, no end play, poor connections, or blown fuses.

Conditions similar to the above can be eliminated in the field by the average service man, but to expect him to go beyond conditions of this nature is really expecting too much, due to the fact that he has so many other conditions to contend with, such as controls, the compressor, condensing units, gases, etc.

In order for a distributor to facilitate the handling of service, it is a very good plan, which incidentally is carried out by the majority, to carry a sufficient number of motors in stock, which will enable their service man to make an exchange on any motor failing in service.

It would, no doubt, be enlightening for service managers and service men, to visit the repair shop handling their motor repair work, to see for themselves the efficient manner in which their motors are handled, and the test which a motor is subjected to after repairs have been completed. The motor is refinished to make its appearance as nearly like a new motor as possible.

We have found it to be a decided advantage, in a great number of cases, and especially on motors used by ice cream manufacturers and on commercial jobs, to bring the leads out of the top of the motor, due to the fact that it makes a much easier installation when re-installing certain jobs on compressors which do not allow a sufficient amount of room between the leads going from the conduit box on the side, and the cooling coil. This saves anywhere from 15 to 30 minutes of service man's time.

Another highlight is in connection with certain motors of a 1/10, 1/8, and 1/4 hp. rating, which have a very short oil well on the rear end, which makes it practically impossible for the service man to oil this motor while on the compressor. When motors such as these are received, an oil extension should be installed by the motor repair shop, to eliminate the failing of the rear end bearing, because of lack of lubrication.

Gates Engineers Outline Three Steps to Be Followed in Inspecting Motor Drives

By the Engineering Department, Gates Rubber Co.

MANUFACTURER'S handy guides of V-belt sizes for refrigeration units make it relatively easy to replace belts on most drives, but the service man's headache is the drive which begins to give trouble after only several months of service.

Although refrigeration drive headaches like these don't develop often, they were an occasional problem in one service department—until the manager hit upon a simple system of making a drive inspection.

This service manager now instructs his service men to make the inspection of the misbehaving drive in three steps, arranged in an order which will uncover the probable reason for trouble in just a few minutes.

Step No. 1: Check for oil, or other foreign material on the belts and sheaves.

Oil on the belt, or dust and dirt on the sheaves, reduce the coefficient of friction, and lower the efficiency of

WHILE THE DRIVE IS RUNNING.

Step No. 2: Check for sheaves and belt "misfits."

If the first two steps do not locate the trouble, it is probable that the belt does not belong on the drive, although the length may be correct.

Symptoms of the "misfit" are (1) a single line of contact between belt and sheaves on either the top or bottom side of the V-belt wall, (2) a belt which rides high out of the groove or too deep in it (the top edge should be flush), (3) a belt which tips in one or both sheaves.

If these symptoms of poor fit appear, and the belt number is that recommended for the model being serviced, it is high time for the service man to notice whether or not the refrigeration unit still contains its original parts. The last man who worked on the job may have repaired a unit by substituting a new motor and sheave, or by replacing both

HOW A MISFIT BELT RIDES IN THE SHEAVE



IT IS EASY TO SEE WHY THIS BELT SLIPS AND BURNS. THIS BELT IS A "MISFIT" ON THE SHEAVE. BELT ANGLES ARE WRONG. IT WILL WEAR THRU ON THE BOTTOM EDGES.

HERE IS HOW THE CORRECT BELT RIDES IN THE SAME SHEAVE



THIS BELT WAS INSTALLED ON THE RECOMMENDATIONS CONTAINED IN A MANUFACTURER'S HANDY GUIDE OF BELT SIZES. IT FITS THE SHEAVE WALL FIRMLY—WILL PULL SMOOTHLY.

the drive. Oil and dirt frequently cause excessive slip, belt whip, and noise. Clean the belts and sheaves carefully with a gasoline dampened cloth, and repair any parts of the machine leaking oil.

Step No. 2: Check the drive for correct tension.

Start the unit, and slap the tight and slack sides of the belt with the fingers. If tension is correct, the tight side of the belt should not vibrate, and the slack side only slightly. There should be no bow in the slack side of the belt.

If the belt is not tight enough, adjust the motor take-up device. Check for correct tension **ONLY**

sheaves, or even by replacing the original compressor unit with that of some other model.

In any of these cases, it is necessary to refer the drive dimensions to the V-belt manufacturer for his recommendations. Cardboard templates of each of the groove angles marked to show top width, the outside sheave diameters, and the minimum and maximum center distances between shafts are the only dimensions required.

This time economizing plan for checking a misbehaving drive permits the service man to make a systematized investigation. Usually he will locate the trouble easily.



1 1/2 Horse Power Century Repulsion Start Induction Brush Lifting, Single Phase Motor

WE LEARN BY DOING

It's an old truth that "We Learn by Doing".

Beginning in the pioneering stages of the industry—more than 20 years ago—Century has been in close daily contact with all the problems of electric refrigerators. . . . As a result—Century Knows Refrigeration!

With the continued development of refrigerating machines and air conditioning, Century has always kept its original pace—with a motor that was more than good enough.

Today Century Motors are more than meeting the requirements of the application and installation.

Take advantage of the experience of Century Engineers and the proved ability of Century Motors.

Century

CENTURY ELECTRIC COMPANY
1806 Pine Street • St. Louis, Mo.
Offices and Stock Points in Principal Cities

MOTORS UP TO 600 HORSE POWER

Methods of Servicing Capacitor Start-Induction Run Motors

SUGGESTIONS for the care of capacitor start-induction run motors for refrigerator applications, and methods of correcting possible difficulties which may be encountered in such motors, have been outlined by the engineering department of the Howell Electric Motors Co. The information, say Howell officials, is designed to prove of value to service organizations in determining different types of motor trouble. The outline is as follows:

When Motor Refuses To Operate

1—Check capacity of fuses. Proper size fuses for 110 volt, 60 cycle, 1,725 r.p.m. Howell Red Band type CI motors are as follows:

- 1/4 hp.—8 ampere fuses.
- 1/2 hp.—10 ampere fuses.
- 3/4 hp.—12 ampere fuses.
- 1 hp.—15 ampere fuses.

2—Be sure that power supply is the same voltage, phase, and frequency as that marked on motor nameplate. If in doubt, consult power company.

3—Measure voltage at motor terminals. See that it is within 10 per cent of voltage stamped on motor nameplate.

4—Remove belt from motor pulley and make sure that motor bearings are in good condition. This can be determined as the shaft should turn freely with only a very slight end play evident. Up and down or side motion indicates worn bushings.

5—The driven appliance should be examined to be sure there is no condition which would cause the motor to start with difficulty or become overloaded.

If motor starts and comes up to speed readily, with belt removed, this point should be checked carefully.

Final Set of Tests

6—If all of the above conditions are correct, and the motor still does not operate, test carefully for the following:

- a—Open or shorted field.
- b—Open or shorted starting capacitor.
- c—Poor contact in centrifugal switch.

Any of these conditions would cause poor operation, and can be readily determined by the following tests.

Remove end bell opposite shaft extension from motor. Disconnect the capacitor leads from the motor winding and centrifugal switch. These leads cross the stator core at the top of the motor between the lamination and the motor frame.

With source of current and suitable indicating device such as lamp or ammeter, test for continuity of running and starting winding—centrifugal switch and starting capacitor. These tests can be readily conducted by referring to the following circuit diagram.

Caution!—A voltage greater than 110-120 volts should not be used in making continuity tests on these motors as damage is liable to result.

Use Alternating Current for Tests

Alternating current should be used for making these tests. The condenser particularly should never be tested with direct current, as it will appear short circuited on direct current, regardless of its condition.

To test the capacitor, connect it to 110 volt a.c. circuit and measure current taken. A normal capacitor will take from 5 to 7 amperes at 110 volts, depending on the rating of the motor. If capacitor takes more than 7 amperes or less than 5 amperes, it should be replaced.

Points A to B—A to D—D to E—C to F—B to C should test (closed). The circuit from E to F should test

(open) with the end bell removed from the motor and (closed) with the end bell in position and the brush on the rings.

All circuits should be checked carefully for ground and if such a condition is found, that particular portion of the motor which is causing the trouble, should be located by testing and isolating the various circuits until the grounded circuit is determined.

The capacitors used with Howell type CI motors are of the electrolytic type, and are designed especially for motor starting purposes. The condenser should be removed carefully and examined for possible grounds to the motor frame.

Removing Starting Capacitor

To Remove the Starting Capacitor it is necessary to remove the end plate at the pulley extension end of the motor.

The starting condenser is insulated from the motor frame, being mounted in four insulating blocks through which the end plate studs pass. In replacing the starting condenser be sure that the insulating blocks are placed over these studs. This will hold the insulating blocks in proper position.

Excessive Sparking at Start

Operation of the centrifugal switch, which disconnects the starting condenser as the motor comes up to speed, may cause a slight spark, which is in no way injurious.

Excessive sparking at start may be due to an accumulation of oil or dirt on the switch rings or to an overload.

Remove the front end plate and clean the switch rings with a piece of dry cloth. If necessary, these may be cleaned with fine sandpaper.

If motor still sparks excessively at start, it is advisable to examine the driven appliance to make sure that there is no condition which would overload the motor or cause it to start hard.

Oiling

Model 14-3 and 14-5 motors are lubricated by wool yarn saturated with oil. The bearings are lubricated at the factory and no oil should be added until the motors are put into service, at which time a small amount of oil may be added.

In service, bearings should be oiled once a year with a No. 20 S.A.E. oil.

When Motor Appears To Run Hot

If motor appears to be abnormally hot, check carefully with thermometer and compare reading with temperature rise indicated on motor nameplate. Remember that the marking on nameplate is temperature rise above room temperature and is degrees centigrade, not fahrenheit. Never judge motor temperature by feel of hand.

If it has been definitely determined that the motor is excessively hot, it should be checked for short circuited turns or coils in stator winding. Bearing trouble may be responsible. A partially frozen bearing would seize the shaft and cause an overload, or too loose a bearing might cause the same condition, as this would permit the rotor to rub the stator.

An easy method of determining this is shown under (4) above. Measure voltage at motor terminals. This should not vary more than 10 per cent from the value stamped on motor nameplate.

Any excessive heating in the motor should be checked carefully as any of the above conditions or a prolonged overload caused by faulty operation of the driven appliance, may cause the motor to burn out.

When Motor Appears Noisy

In spite of precautions taken when packed for shipment, motors are sometimes damaged by rough handling. In case a motor appears to be excessively noisy, it may be caused by rotor unbalance or air gap not being uniform. This should be corrected by rebalancing the rotor and by checking the shaft to be sure it is not sprung.

The motor should be examined to be sure that bushings are not worn and that outlet box, oil pipes, and other fittings are tight. It is well to determine whether motor is securely fastened in place, and that it is properly aligned with driven appliance.

Melco Lists Parts for Compressors

NEW YORK CITY—Melchior, Armstrong, Dessau Co. is now offering compressor replacement parts for a number of leading makes of refrigerators.

Melco Catalog No. 5, recently issued by the company, lists replacement parts for Frigidaire and Kelvinator compressors; piston rings for Copeland, Servel, Merchant & Evans, Frigidaire, Kelvinator, Leonard, Potter, Universal Cooler, and Welsbach units; piston and flapper valve discs for Copeland, Frostaire, Servel, and Zerozone; and rotary seal replacement units for Buckeye, Copeland, Electro-Kold, Frigidaire, General Electric, Kelvinator, King Kold, Majestic, Mohawk, Norge, Servel, Wayne, Welsbach, and Zerozone.

Connecticut Dealers See New Crosley Radios

HARTFORD, Conn.—Radio dealers from all parts of Connecticut were guests of Thomas J. O'Brien, president of the Hartford Electric Supply Co., Crosley distributor here, at a showing of the 1936 Crosley radio models held recently at the Rockledge Country Club.

Assisting Mr. O'Brien were Dwight A. Pease, vice president of the distributing firm, and H. D. Schumacher, New England sales manager for Crosley.

Proper Lubrication & Adjustment Required For Refrigerator Type Motors

By E. L. Splitstone, Chief Production Engineer, Emerson Electric Mfg. Co.

MOTORS furnished by Emerson for domestic refrigerators have wool packed bearings, and when shipped from the factory have sufficient lubricant to operate three to five thousand hours, or equivalent to a normal year's operation.

These motors should be oiled once a year with a sufficient amount of oil to thoroughly saturate the wicking, however, extreme care should be exercised to avoid adding more oil than can be absorbed by the packing.

Excess Oil May Cause Damage

If an excess amount of oil is added it will overflow inside of the motor and may later interfere with the proper operation of the motor. A medium weight mineral oil of good quality, preferably an S.A.E. 20 crankcase oil, will give the best results.

In installing the motor, proper belt tension should receive careful consideration. Unless the motor is supplied with an automatic belt tightener, it is advisable to leave the belt as loose as practical, without slipping, when the compressor is started.

A tight belt will impose an excessive load on both the compressor and the motor bearings and result in abnormal wear on both of these parts.

If the motor is properly oiled, it should not require any particular care

or attention, however the motor should be cleaned occasionally, as should also the screens or ventilating openings in the box, to facilitate an unobstructed flow of circulating air.

If the motor is slow in starting, it appears to labor in operation, it should be checked immediately by a competent service man, to determine the cause. Frequently, it will be found that this condition is caused by the compressor. If the motor fails to start, all connections should be checked carefully and fuses inspected to be sure that current is reaching the motor.

Trouble in Cut-out

When the motor hums, but does not start, and the compressor is found to be free, the trouble may be traced to the cut-out mechanism in the motor.

Usually when this condition exists, cleaning of the cut-out parts will remedy the trouble; however, if the motor has been in service for a great length of time, it may be necessary to replace the excessively worn or damaged cut-out parts.

Likewise, motor bearings, may become worn through neglect in oiling, or through improper belt tension, in which case the bearings should be replaced by a competent motor service engineer.

No. 674 Thermostatic Expansion Valve (Non-Adjustable)

Prompt functioning of gas charged valve eliminates lag in bringing system into balance—capacities up to 2 tons of sulphur dioxide or Freon. See Bulletin 68.

No. 785

Thermostatic Expansion Valve
Gas charging assures maximum motor efficiency and tight closure when suction pressure rises beyond a specified point, regardless of the temperature of the thermostatic bulb. Capacities up to 20 tons for air conditioning. See Bulletin 71.

No. 673

Automatic Expansion Valve
Either gas or liquid charged—sensitive, efficient and dependable on either low or high temperatures. Thermostatic element provides automatic operation. Assures full flow and maximum tonnage. Capacities up to 2 tons sulphur dioxide or Freon.

No. 250

Pressure Control (Model RB-3)
Accurately controls low side pressure. Range 20 inches vacuum to 40 lbs. pressure. Differential adjustable from 5 to 25 lbs. Available in other models to control temperatures. See Bulletin 60.

No. 250

Dual Pressure Control (Model RIBA)
Combines high side pressure cutout with low side pressure control. Two adjustment ranges available for high side cutout and low side pressure. Differential 20 lbs. for each range. Available in other models for temperature control. See Bulletin 60.

No. 683-R

Solenoid Valve
A dependable shut-off for liquid or suction lines in both air-conditioning and refrigeration. Draws approximately 12 watts during operating period. Furnished with either 1/8 or 1/4 inch orifice. See Bulletin 34.

No. 261

Cabinet Thermostat
Positively insulated against both radiant and conducted heat. A high voltage control entirely concealed except for the knob on the outside of the cabinet. Permits integral wiring of a portable cabinet heater or cooler. See Bulletin 67.

No. 443

Thermostat
Used for either heating or cooling or both. Range 40 degrees to 90 degrees. One blade makes circuit on decrease in temperature and a second blade makes circuit on increase in temperature for cooling. See Bulletin 46.

Many other "Genuine Detroit" Controls, including Electric Water Valve, Limit Switches, Fan Switches, Combined Fan and Limit Switches, Room Thermostats, Relay Transformers, Differential Thermostats, Strainers, Damper Motors, Zone Controls, Self-Cleaning Nozzles, Filters, etc.

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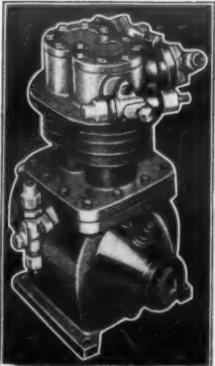
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BARE COMPRESSORS

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If you are assembling or servicing you should have our complete catalog and data sheets.

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Overload Protector On Penn Controls Adds Few Problems

DES MOINES—Addition of the bi-metal overload protection to the Penn Electric Switch line of refrigeration controls has added no special problems to the installation or servicing of these controls in the field, claim Penn engineers.

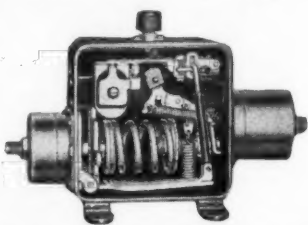
The Penn line of controls now includes various models of the type L for maintaining uniform temperature or pressure; the type LS for performing the above function, plus the addition of a high pressure safety cut-out; and types LC and LSC, which are the above described controls, with the addition of bi-metal overload protection.

Trip-out Is Factory Set

The trip-out timing for all overloads is factory-set to provide positive motor protection. It is such that harmless temporary overload conditions will not cause trip-out, say Penn engineers.

It is unnecessary to adjust the trip-out timing of the Penn types LC and LSC controls in the field. The only added problem involved in installing

Control's 'Insides'



Details of Penn's latest-type Refrigeration control

or servicing these controls is the job of checking the heater element rating in the switch against the rating of the motor to be controlled. This is necessary in making new installations or when a new motor is installed on an existing system.

Heater Element Rating

Most refrigeration manufacturers specify the heater element rating (in amps.) to be used on each motor supplied with their equipment. These specifications should be followed when they are known.

Otherwise, a heater element rated at 140 per cent of the full load current rating of the motor (in amps.) is recommended. For instance, a motor rated at 7 amps. would require a 9.8 amp. overload heater element.

To change heater elements in types LC and LSC controls, the service man should simply loosen the two screws holding the element (it is not necessary to completely remove them), slip the old element out, replace with the element of proper rating, and turn the two screws down snugly.

Adjustments Are Same

Adjustments of the types LC and LSC for range and differential (difference between cut-in and cut-out point in temperature or pressure) are made the same as on previous type L controls.

In this connection, Penn engineers recommend that the service man familiarize himself with the bi-metal overload mechanism now offered by Penn in its type 201 line of replacement domestic refrigerator controls.

In these controls, as in the types LC and LSC for commercial service, the overload trip-out is accomplished by the warping of a bi-metal strip. Trip-out timing is factory-set and requires no adjustment in the field.

Again, as in the case of the commercial controls, the service man must check the heater element rating of the switch against the rating of the motor (in amps.) to be sure of providing proper protection without unnecessary tripping out under normal operation.

Reset Button Provided

In both the types LC and LSC for commercial service and the type 201 for domestic service, a trip-free reset button is provided. It is necessary to reset the trip-out mechanism with this button before the system will again operate, yet it is impossible to block the contacts of either of these controls in closed position by accidentally or intentionally permanently depressing the reset button.

On either domestic or commercial installations, and particularly the latter, service men should warn their customers to determine the cause of the overload which caused the trip-out before resetting the trip-out device and re-starting the unit.

LARKIN COILS
for...
AIR CONDITIONING

Handy Reference Table to Remedies for Motor Troubles

Refrigeration Motor Troubles Diagnosed, Probable Causes, Tests, Remedies Presented in Convenient Tabular Form by Wagner Electric for Use of Field Service Engineers

PROBABLE CAUSE

TEST AND REMEDY

(A) Failure to Start

1. Fuses blown.

1. Check capacity of fuses. They should not be greater in ampere capacity than recommended by appliance manufacturer and in no case smaller than full-load ampere rating of motor, and a voltage capacity equal to or greater than voltage of supply circuit.

2. No voltage or low voltage.

2. Measure volts at motor terminals with switch closed. See that it is within 10 per cent of voltage stamped on nameplate of motor.

3. Open-circuited field or armature.

3. Indicated by excessive sparking in starting, or refusal to start at certain positions of rotor, or by humming sound when switch is closed. Examine for broken wires, loose connections, or burned segments in commutator at point of loose or broken connection. Inspect commutator for foreign metallic substance which might cause short between commutator segments.

4. Improper current supply—Incorrect voltage or frequency.

4. Requires new motor built for operation on local power supply. D.C. motors will not operate on A.C. circuit or vice versa.

5. Worn brushes or sticking brushes.

5. When brushes are not making proper contact with commutator, the motor will be weak in starting torque. This can be caused by brushes worn, brushes sticking in holders, brush springs weak, or commutator dirty. Commutator should be polished with fine sandpaper (never use emery) (commutator should never be oiled or greased).

6. Improper brush setting.

6. Unless a new armature has been installed the brush-holder or rocker arm indicator should be opposite index and locked in position. If new armature has been installed the position may be slightly off original marking.

7. Improper line connection.

7. See that connections are exactly like connection diagram which is sent with motor. Motor may through error be connected for higher voltage and connected to lower voltage supply.

8. Excessive load.

8. If the motor starts idle and if all the above conditions are O.K. then failure to start is most likely due to excessive load. To determine this definitely make or have a reliable electric shop make a test of starting torque. Wagner fractional horsepower repulsion induction motors have a starting torque of 350 per cent or more of full load torque. If the load requires more than this a larger motor is required.

If this figure is 350 per cent of full load torque on a new motor (may be slightly less on a used motor) consult the nearest Wagner branch inasmuch as this would indicate either a misapplication of the motor, resulting in too great a load or an increased load due to faulty driven apparatus.

To determine the starting torque, either of the following methods may be used:

a. PRONY BRAKE. This method is probably the most generally used. It requires a pulley, brake arm, and scale (may be either platform scale or spring balance, if platform scale be sure that load is applied to center of platform, if spring balance is used the pull must always be at right angle to the brake arm, and in either case scale must have small enough variations to accurately read torque on smaller rated motors). Brake arm should be made up so that the distance between center of pulley and contact point where load is measured is exactly 12 inches. Scale reading will then be in pounds feet. BEFORE STARTING TEST MAKE SURE THAT DIRECTION OF ROTATION IS SUCH THAT BRAKE ARM WILL BE MOVED AGAINST BALANCE. In order to measure starting torque clamp arm to pulley tight enough to allow pulley to turn very slowly—read scale when slowly turning. To measure pull in torque release clamp until motor is just able to throw off brushes and pull up to speed. Read scale just as brushes are leaving commutator. The true pull in torque is the highest scale reading for which the brushes will throw off and stay off the commutator.

b. ROPE AND WEIGHT. This method gives equally satisfactory results and yet does not require the equipment of the Prony Brake method. It requires a smooth face flanged iron pulley, rope, and weight. Tie one end of the rope to the projection from the test bench so that the rope will be at 90° to the shaft. Wrap the rope around the pulley opposite to the pulley rotation and hang a weight on the free end of the rope. Wrap sufficient turns around the pulley so that the tied end of the rope will be slack when the weight is lifted and the pulley rotates. To prevent the rope from gripping the pulley, oil or paraffin the rope slightly. Be sure that the hanging weight does not touch the floor or test bench. SOME PROTECTIVE MEASURES SHOULD BE TAKEN TO PREVENT THE WEIGHT FROM INJURING THE OPERATOR IN CASE THE ROPE GRIPS TOO TIGHT. Proceed to test as follows. Increase the weight until the motor will just start, then calculate as follows:

For example to test a ¼-hp., 1,725 r.p.m. motor select a 4-in. pulley, ½-in. rope, and necessary weight. If assortment of graduated weights not handy use bucket and sand (or shot) adding weight so that pulley is slowly turning.

Pulley, dia. in inches + rope dia. in inches

Brake Arm = $\frac{12 \times 2}{4 + .125}$

ft. 24

Starting torque in Lb. Ft. = Brake Arm × Wt. hung on rope =

4.125 × W 24

Full Load Torque in Lb. Ft. =

Full Load Hp. × 5250 .25 × 5250

Full Load R.p.m. 1725

Starting Torque in % of F.L. Torque = $\frac{4.125 \times 24}{.25 \times 5250} = .76$ Lb. Ft.

Starting Torque

Full Load Torque

While both of these methods are widely used by small service organizations for checking test values on electric motors of all sizes, it should be specially noted that both methods do contain an element of danger to the operator, and should be used with extreme care from the standpoint of both safety to operator and accuracy of test results.

PROBABLE CAUSE

TEST AND REMEDY

9. Shorted stator.

9. See D-2 below.

10. Shorted rotor.

10. Remove brushes from commutator and impress full voltage on the stator. If there are one or more points at which the rotor "hangs" or fails to revolve easily when turned the rotor is shorted. By forcing the rotor to the position where it is most difficult to hold, the short can be located as the shorted coil will become hot. Do not hold in position too long or coil will burn out.

(B) Motor Operates without Releasing Brushes

(Brushes should leave commutator in 5 to 10 seconds. Troubles result from delayed operation.)

1. Dirty commutator.

1. Clean with a piece of fine sandpaper. (Do not use emery.)

2. Governor mechanism or brushes sticking or brushes worn too short for good contact.

2. See that brushes move freely in slots and that governor mechanism operates freely by hand. Replace worn brushes with new.

3. Frequency of supply circuit incorrect.

3. Run motor idle. After brushes throw off, speed should be slightly in excess of full-load speed shown on nameplate. An idle speed varying more than 10 per cent from nameplate speed, indicates that motor is being used on a supply frequency for which it is not designed, and a different motor will be required.

4. Low voltage.

4. See that voltage is within 10 per cent of nameplate voltage with the switch closed.

5. Line connection improperly or poorly made.

5. See that contacts are good and that connections correspond with diagram sent with motor.

6. Incorrect brush setting.

6. Check to see that rocker arm setting corresponds with index mark.

7. Incorrect adjustment of governor spring.

7. The governor should operate and throw off brushes at approximately 75 per cent of speed stamped on nameplate. Below 65 per cent or over 85 per cent indicates incorrect spring tension.

8. Excessive load.

8. An excessive load may be started and not be carried to and held at full load speed which is beyond where the brushes throw off. Tight motor bearing may contribute to overload. This is sometimes indicated by brushes coming off and on commutator. See also A-8.

9. Shorted stator.

9. See D-2.

(C) Excessive Bearing Wear

1. Belt tension too great; unbalanced or out-of-line coupling; eccentric or too closely meshed gears.

1. Correct mechanical condition.

2. Improper, unclear, or insufficient oil.

2. The lubrication system of Wagner small motors provide for supplying the right amount of filtered oil to bearing. It is only necessary for the user to keep wool yarn saturated with a good grade of machine oil.

3. Dirty bearings.

3. When bearings get clogged with dirt motor may need protection from excessive dust. Application may be such that especially constructed motor should be used—consult Wagner.

(D) Motor Runs Hot

(Don't judge motor temperature by feel of hand. Measure it with a thermometer and check with temperature rise stamped on nameplate.)

1. Bearing trouble.

1. See condition under C.

2. Short circuited coils in stator.

2. Best check is separate wattmeter reading on each of two halves of stator winding. Sometimes shorted coil may be located by fact that one coil feels much hotter than other. Very great increase over normal in magnetic noise may also indicate shorted stator.

3. Rotor rubbing stator.

3. Some extraneous matter may be between rotor and stator, or bearings may be badly worn.

4. Excessive loads.

4. Be sure proper pulleys are on motor and machine. Driving the load at higher speed requires more horsepower. Take an ammeter reading. If current draw exceeds nameplate amperes for full-load, the answer is evident.

5. Low voltage.

5. Measure voltage at motor terminals with switch closed. Should not vary more than 10 per cent from value stamped on nameplate.

6. High voltage.

6. See No. (5).

7. Incorrect line connection to motor leads.

7. Check with connection diagram sent with motor.

(E) Motor Burns Out

1. Frozen bearings

1. Causes may be same as under (C).

2. Some condition of prolonged excessive overload.

2. It is important that the load be examined before the burned out motor is replaced so as to locate and remove the cause of the overload. Certain jobs such as refrigerators which represent heavy load will under unusual conditions of operation, apply prolonged overloads which may destroy a motor and which may be difficult to locate unless examined carefully. On jobs where it is assumed somewhat intermittent service will normally prevail and which consequently are closely motored, the load cycle should be especially checked, as a change in this feature will easily produce excessive overload for the motor. Examine carefully to determine mechanical condition of the driven appliance.

(F) Motor Is Noisy

1. Unbalanced rotor.

1. When transportation handling has been so rough as to damage the heavy Wagner shipping case, it is well to test motor for unbalanced conditions at once. It is even possible (though it rarely happens) that a shaft may be sprung. In any case the rotor should be rebalanced dynamically.

2. Worn bearings.

2. If unduly frequent, examine for cause. See (C).

(Concluded on Page 17, Column 1)

Motor Remedies Reference Chart

(F) Motor Is Noisy

(Concluded from Page 16, Column 5)

PROBABLE CAUSE

3. Rough commutator or brushes not "seating" well.

4. Excessive endplay.

5. Motor not properly aligned with driven machine.

6. Motor not firmly fastened to mounting base.

7. Loose accessories on motor.

8. Air gap not uniform.

9. Amplified motor noises.

TEST AND REMEDY

3. This noise occurs only during starting period, but conditions should be corrected to avoid consequent trouble.

4. Proper endplay is as follows:
 $\frac{1}{2}$ hp. and smaller—0.005 to 0.030.
 $\frac{1}{2}$ to 1 hp.—0.010 to 0.075.

Washers supplied by factory should be used. Be sure to tell factory all figures involved. Remember too little endplay is at least as bad as too much.

5. Correct mechanical condition.

6. All Wagner small motors have steel bases so they can be firmly bolted to mounting without fear of breaking. It is of course not to be expected that the base should be strained out of shape in order to make up for roughness in mounting base.

7. Such parts as oil covers, guards, if any, on endplate, etc. should especially be checked for security if they have been removed for investigation of any sort. The conduit box should be tightened when top is fitted after connections are made.

8. This results from sprung shaft or unbalanced rotor. (See No. 1 above.)

9. When this condition is suspected, set motor on a firm floor, and if motor is quiet, then the mounting is acting as an amplifier to bring about certain noises in the motor. This may occur even though mounting is quite firm in structure. Frequently correction of slight details in the mounting eliminates this but rubber-mounted type motors almost invariably do.

(G) Excessive Brush Wear

1. Dirty commutator.

2. Poor contact with commutator.

3. Excessive load.

4. Failure to throw off promptly and stay off during the running period.

5. High Mica.

6. Rough commutator.

1. Clean with piece of fine sandpaper. (Never use emery.)

2. See that brushes are long enough to reach commutator, that they move freely in slots, and that brush spring tension gives firm but not excessive pressure.

3. If brush wear is due to overload, it can usually be checked by noting the time required for lifting the brushes from the commutator. Proper time is not in excess of 10 seconds.

4. Examine for conditions listed under (B).

5. Examination will show this condition and the remedy is to take a very light cut-off commutator face and polish with fine sandpaper.

6. See (5).

(H) Brushholder or Rocker Arm Wear

1. Failure to throw off properly and stay off during the running period.

1. No noticeable wear of this part should occur during life of motor. Troublesome wear indicates faulty operation. See under (B).

Money Can Be Saved

with



(Virginia Methyl Chloride)

It can be used with flange-jointed copper tubing, which costs much less than the welded steel construction required for ammonia.

Its boiling point is -10.6°F ; it is remarkably free from moisture and acidity; and it is particularly suited for use in refrigerated showcases, ice cream cabinets, store refrigerators, etc.

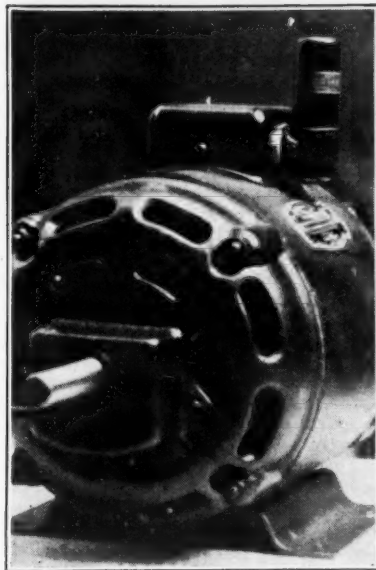
Being made by the makers of EXTRA DRY ESOTO, its uniform quality is assured. The coupon will bring interesting information.



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 Send me the literature I have checked. I am interested in receiving any additional literature on Electrical Refrigeration you may issue from time to time.
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☐ Folder: Transferring from large to small cylinders
☐ Circular: Physical properties of various refrigerants
 Name
 Street & No.
 City & State

Overload Device



The Ermstat installed on the conduit box of a motor.

Ermstat Introduces Motor Protector

PHILADELPHIA—A new fully-automatic control for use on fractional horsepower repulsion induction type motors, is being introduced this year by Electric Refrigeration Motor Co., Inc. It was developed by Henry Weirich, electrical engineer associated with the Ermstat Co.

The control is designed to prevent the burning out, either partially or completely, of repulsion induction type motors.

Installed on the conduit box of any motor, the control is governed primarily by the amperage rise, without interference with the motor's operation. The unit is bi-metallic operated, with virgin silver contacts, permitting long life.

Each unit is factory-sealed, with no adjustments nor replacement of elements possible, and is made for a specified horsepower, voltage, and cycle.

In addition to eliminating burnt-out motors, the control is also said to materially decrease service calls attributed to blown fuses, high or low voltage, head pressures, and similar difficulties.

When the amperage rises to such an extent as to endanger the motor windings, the elements of the Ermstat come into use and break the circuit, permitting the contacts to reset after a period of time, completing the circuit and permitting the motor to resume operation. If the condition remains, the control continues to operate until it threatens the insulation or motor windings.

Life of the control is said to be indefinite. It is manufactured in horsepower ratings from $\frac{1}{4}$ to 1, 110 and 220 volts, a.c., and is connected in series with the motor.

Condor Belts Described In New Bulletin

PASSAIC, N. J.—The Manhattan Rubber Mfg. division of Raybestos-Inc., has just issued a new bulletin describing and explaining details of the construction of the Condor V-belts which it manufactures.

In the construction of the belt, the cross section was so designed and the angle so adjusted that under operating conditions, the belt runs smoothly into the sheave grooves, increasing its gripping power and reducing side wear, said to be a major problem in belt manufacture.

York Equipment Cools Chinese Theater

NANKING, China—First air-conditioned theater in Nanking is the new Capitol theater here, which has put in a year-round air-conditioning system, the installation being made by York Shipley, Inc., Shanghai branch of York Ice Machinery Corp.

Feature of the system is a design maintaining graded temperatures from the ticket foyer, through the second or "crush" lobby, to the auditorium, so patrons entering or leaving the theater will not experience shock from a too abrupt change of temperature.

Mechanical elements of the air-conditioning plant consist of a York Freon compressor driven by a 125-hp. motor, shell and tube type condensers, and a spray type air-conditioning unit.

The system uses a 50-ft. cooling tower for condensing purposes. Source of water for this system is a deep, cool well, with an auxiliary source of supply from the city's mains.

A multivane fan, 36 in. in diameter, driven by a 30-hp. motor, draws air into the conditioning apparatus where it is filtered, washed, and cooled. In winter, a section of heating coils provides warm air. The air is distributed through ducts.

A.S.R.E. Program for Winter Meeting Is Announced

(Concluded from Page 1, Column 1)
 Be a Closed Profession. Contestants to be students of the Stevens Institute and the Polytechnic Institute of Brooklyn.

Thursday, Dec. 5, 10 a. m. Third Session (Salle Moderne): Topic, Commercial Practice. Chairman: H. M. Williams, vice president, A.S.R.E.

"Measurement of Evaporator Capacity by Metering," R. C. Warneke, General Electric Co., Ft. Wayne, Ind.
 "Truck Refrigeration for Perishables," George Lange, vice president, American Ice Co., New York City.

"Factors in Farm and Community Refrigeration," W. R. Woolrich, R. B. Taylor, and Mack Tucker, University of Tennessee, Knoxville, Tenn.

"SO₂ Film Heat Characteristics in Vertical Evaporator Pipe," Professors F. S. Hechler and F. C. Stewart, Pennsylvania State College.

12:30 p.m. Council luncheon (roof garden).

2:30 p.m. Fourth Session: Topic, Applications of Air Conditioning. Chairman: S. C. Bloom, vice president, A.S.R.E.

"Specifications for Air Conditioning," E. W. Goodwin, senior mechanical engineer, Procurement Division, Treasury Department, Washington, D. C.

"Proposed Standards for Rating and Testing Air Conditioning Equipment," Glenn Muffy (for Joint Committee).

"Pipe Line Air Conditioning," Nels H. Rosberg, manager of production, California Consumers' Co., Los Angeles, Calif.

"New Installation in Gimbel-Saks Stores," description by C. S. Leopold, consulting engineer, Philadelphia, Pa., followed by inspection tour.

7:30 p.m. Annual dinner dance (on the roof garden). Maurice Wolfie's orchestra. Dress optional—\$2.50 per person.

Friday, Dec. 6, 10 a.m. Fifth Session: Chairman, Harry Harrison, president, A.S.R.E.

"New Investigations of Storage Properties of Foods," D. H. Rose, senior physiologist, Bureau of Plant Industry, Department of Agriculture, Washington, D. C.

"Brine Ice," Crosby Field, Flakice Corp., Brooklyn, N. Y.

"Proposed Standard for Rating and Testing Mechanical Condensing Units," L. S. Morse (for Joint Committee).

Two Added to Wholesale Radio Service Co. Staff

NEW YORK CITY—Two additions to the advertising staff of Wholesale Radio Service Co., Inc., refrigeration and radio parts jobber, have been made by Robert Hertzberg, advertising manager.

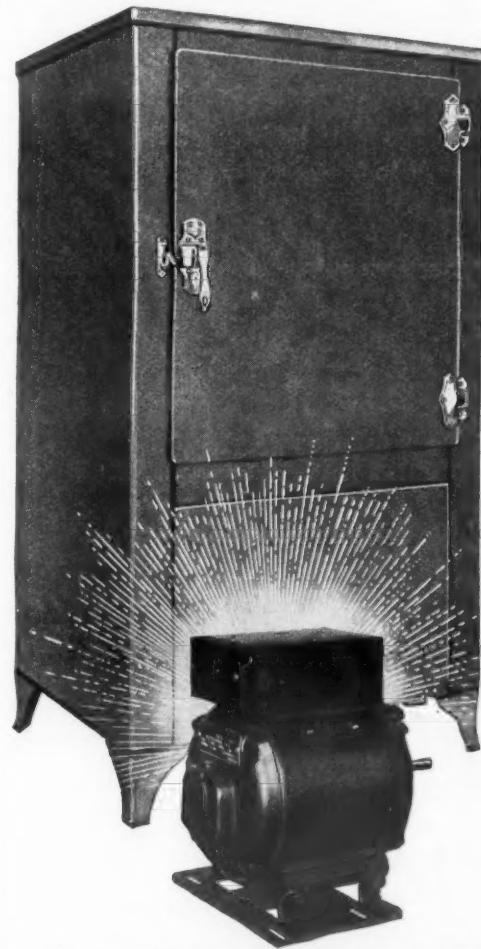
H. M. Bayer, graduate of Pratt Institute and one-time technical editor of *Radio News*, has been named technical consultant and copy writer, and Sidney Dru, commercial artist, has been placed in charge of the firm's art department.

Wilson Adds Detroit to Kerotest Territory

DETROIT—T. F. Wilson, Kerotest Mfg. Co. field representative covering Buffalo, the Mohawk Valley (upper New York State), and eastern Canada, has added Detroit to his territory, and will move his headquarters from Buffalo to this city.

WAGNER MOTORS

are
 Well-Designed



DUE to precision of manufacture, careful selection of materials and parts, and intelligent engineering, Wagner motors conform to refrigerator manufacturers' demands for well-designed auxiliary equipment.

Every single item that has a definite bearing on the appearance of Wagner motors contributes to its mechanical efficiency. Drip-proof end-plates, for example (see Photo N445), protect the motor from falling dirt and liquids, and protect individuals

from contact with moving parts. Ample ventilation is secured from openings located underneath the bearing housings.

Another important feature contributing to the appearance and long-life qualities of Wagner motors is the non-corrosive, rust-resisting finish. All parts of the stator frame first receive a primer coat of Japan, (thoroughly baked in special ovens at a temperature of 450 degrees F.), selected for its penetrating and adhesive properties. All completed motors receive a finishing coat of heavy lacquer, selected for its rust-resisting and oil-proof qualities, sprayed on under pressure to insure a smooth, even surface, and thoroughly dried in temperature-controlled ovens.

All parts and completed motors undergo careful and thorough tests according to all N. E. M. A. specifications, — your assurance of reliable, quiet, trouble-free, quality motors. Photo K1261 shows a view of one of the test boards with a motor undergoing tests.

Wagner Bulletin 167 will be sent upon request.

Wagner Electric Corporation
 6400 Plymouth Avenue, Saint Louis, U.S.A.

MOTORS - TRANSFORMERS - FANS - BRAKES

CONTROLS

Care and Maintenance of Switch Contacts on Controls

By the Engineering Department, Allen-Bradley Co.

MAINTENANCE of electrical control equipment resolves itself largely into the care and maintenance of switch contacts. Magnetic coils, relays, switching mechanisms, resistors, and other miscellaneous items which make up the control equipment found in the modern refrigeration plant, give relatively little trouble. Whatever "bugs" have developed in this apparatus have been almost entirely eliminated.

Today, as always, it is the contacts themselves, which must open under heavy currents, that cause the greatest amount of trouble.

The inherent characteristics of an electric current are responsible for all the contact maintenance and contact attention necessary. An electric current possesses what may be termed electrical inertia—that is, the current tends to continue its flow, even after the circuit has been broken.

When contacts through which current is flowing are opened, this continuation of the current manifests itself in the form of an arc. Unless this arc is immediately extinguished, it generates enough heat to burn or melt the contacts and oxidize the contact metal.

Oxides Formed by Arcing

If the oxide formed by the arcing has a high resistance, the contacts have to be periodically filed or "dressed" to remove the coating of oxide and to present a low resistance to the flow of current.

Furthermore, unless contacts are correctly designed, and of generous size, they soon become so worn and burnt away that they have to be replaced.

Simple knife switches cannot be frequently opened under heavy loads, for the arcing at the contacts will so burn and blister the blades that trouble will result. In addition, there is also grave danger that such switches may flash over. Knife switches should be used only to open a circuit after the power has been disconnected at some other point.

New blades must then replace the old ones. The more often knife switches are opened under load, the more often they will require new blades.

When opening knife switches, the blades should be separated as rapidly as possible, so that the arc is quickly extinguished. The recently developed quick make-and-break knife switch has proved superior to the ordinary knife switch for this very reason, as the contacts are broken more quickly.

Arc Snuffers Employed

However, when switches of this type are used consistently to break medium sized loads, they will still arc sufficiently to pit the blades and in time prevent the proper operation of the switch. Recently, quick make-and-break type of switches have been further improved by equipping them with arc snuffers so they can safely interrupt locked motor currents.

During the past year there has been developed a more modern type of manually operated quick make-and-break switch. This new switch, unlike the knife switch which has sliding contacts, has butt-type contacts, constructed to interrupt the arc quickly and to eliminate contact burning.

A slight blister on these contacts will not interfere with the successful operation of the switch, and the contacts can always be closed. The switch is usually operated by push buttons. Older switch constructions were operated by toggle lever.

In the Allen-Bradley Bulletin 609 starter of this type, patented silver-alloy contacts have been used to step

up arc rupturing capacities and to eliminate all contact maintenance. Contacts made of this material form an oxide which does not act as an insulator as does copper oxide. Thus, periodic filing and dressing are not necessary; in fact, this type of starter can operate indefinitely without any attention whatsoever beyond an occasional inspection.

Automatic motor starters and other magnetic contactors have required the closest attention of the electrical maintenance man. Most of the contacts on these switches are of the copper-to-copper type, with a rolling action designed to wipe the contacts clean at every closure.

In closing, the contacts come together in such a manner that the initial contact is made on the upper part of the contact surface. As the switch closes farther, the manner in which the contacts are mounted allows the point of contact to roll down so that when the contactor is completely closed the current is being carried by an entirely different section of the contact surface.

When the switch opens the contacts again roll upward and break the current on the upper surface. This confines all arcing to the upper surface and insures clean contact surfaces for the running current.

Trouble May Result

Unless designed with the greatest care, these rolling-type, copper-to-copper contacts are apt to cause trouble. At closure the impact of the two contacts causes a rebound, rapidly making and breaking the circuit, resulting in arcing and burning, and sometimes complete fusing of the two contacts.

The heat generated by this arcing coats the contacts with a black copper oxide of high resistance. This high contact resistance due to the copper oxide formation causes undue heating of the contacts. It is therefore necessary for the maintenance man to make weekly or monthly inspections, and all contacts should then be filed and cleaned up.

Contacts can remain quite rough and still operate satisfactorily, but when an oxide coating forms, it is necessary that they be filed. Naturally, this burning and filing greatly reduces the life of the contacts, and they must be frequently replaced.

Eliminate Contact Trouble

Modern automatic switches have eliminated practically all of these contact troubles. The more advanced designs incorporate a solenoid switch mechanism which provides a straight-line motion between the contacts. With this straight-line motion it is possible to eliminate practically all contact rebound so that there is relatively little danger of the contacts fusing together.

Then, too, steps have been taken to reduce the arc when the switch is opened under heavy loads. Individual arc hoods completely surrounding each contact, as well as careful contact design, have helped to decrease the size of the arc and, therefore, to lengthen the useful life of the contacts.

The Allen-Bradley Co. has recently developed a patented silver-alloy contact material which it uses in its automatic across-the-line solenoid starter and in other starters in its line. These contacts do not form an insulating oxide when exposed to the high temperatures of the electric arc, and as a result can operate for indefinite periods without any attention whatsoever.

Difference in Equipment

In the maintenance of control equipment for refrigeration machinery, there is a great difference between equipment that starts and stops every so often under the control of thermostats or pressure controls, and equipment that runs continuously for possibly weeks at a time.

Thus in air-conditioning service, the machinery would be frequently started and stopped, while in a commercial ice plant, operation would be continuous.

Where equipment runs continuously, and switching apparatus uses copper-to-copper contacts, the contacts often overheat and cause trouble. In such cases, the control must either be of a larger capacity than would otherwise be necessary, or the switches should be opened once a day or thereabouts so that the contacts will find a new seat.

Where equipment is installed near the waterfront, and the switches stay closed for a long time, electrolysis will set in. The use of silver-to-silver contacts has largely eliminated this trouble.

Another cause of trouble in refrigerating control equipment is the "cycling" of equipment. Cycling is the frequent starting and stopping of a motor due to bad pilot switch contacts, chattering of pilot contacts, or leaky valve. Where the load carried is as large as the maximum rating of the switch, and where cycling occurs, contact trouble will ultimately result.

In such cases, welding of contacts has been known to occur. Silver-to-silver contacts will stand up better under these conditions than copper-to-copper contacts, but it is impossi-

New Features Have Simplified Operation & Care of Controls

By G. E. Graff, Ranco Division,
Automatic Reclosing Circuit Breaker Co.

IMPROVEMENT of temperature controlling devices for electric refrigerators have kept pace with the development of beauty and operating economy in the household refrigerator itself. Fifteen years ago temperature controls for household refrigerators were adaptations of commercial controls; crude, unsightly, and often bulky devices which were hidden in the machine

compartment or on top of the evaporator as far out of sight as possible. The satisfactory balance between freezing speeds and food compartment temperatures was rarely obtained.

Engineers who would specialize on the development and manufacture of the control focused their attention on it. Thus the control for mechanical household refrigeration became one of specialization rather than a side issue in a refrigerator factory.

The first thoughts of these control engineers were simplification, and the improvement of operation and application of the temperature control. Then in order to obtain more satisfactory desert freezing a limited or modified adjustment was added to the control.

This adjustment has been termed "temperature regulator," "cold control," etc. It met such complete approval that its use is now almost universal.

Incorporation of attractive escutcheon plates, dial pointers and knobs, and considerable reduction in size ended the unsightliness of the controls and made them a display feature on household refrigerators. Therefore, they were conveniently located, facilitating the addition of other features to the controls.

Thermal overload protection was next to become a recognized part of the refrigerator control. The early designs consisted of a heater coil surrounding a solder well so that

ble to guarantee any starter under such conditions. The only real remedy is to keep the pilot switches and valves in good condition so as to prevent the occurrence of cycling.

As a rule, switch for d.c. equipment will give more contact trouble than a.c. switches, especially when the control is too closely rated.

At times, trouble has been experienced on d.c. where smaller motors, not designed for line starting, are thrown directly across the line. Such motors will take 8 to 10 times normal running current, putting a serious load on the contacts.

Contact troubles today, on the most modern type of starters, have been reduced tremendously by better methods of arc suppression and improved contact materials. Where a modern starting switch of a conservative rating is selected, unless conditions are especially severe, the only attention it requires is an occasional inspection.

excessive heat would melt the solder and permit rotation of the ratchet to open the switch.

Thermal overload design, like the early models of temperature control, was due for vast improvement and specialization. Within the last two years the heater coil of this motor protector has been enclosed within a ceramic insulator which fits snugly inside the solder pot, thus eliminating the difficulties found in former designs.

Rapid strides of the domestic refrigeration industry brought in rapid succession many new features into the design of controls: dial defrost, semi-automatic defrost, and semi-automatic fast freeze have been most popular.

Dial Defrost—when the dial pointer is turned to the "defrost" position the cut-in point is high enough to permit the melting of the frost on the evaporator and the cut-out point low enough to provide the refrigeration necessary for the preservation of food in the food chamber. This position on the dial is sometimes called "economy" or "vacation."

Semi-Automatic Defrost—manual operation of a button or lever on the control interrupts the regular operating cycles until the evaporator temperature rises to a predetermined value sufficiently high to completely defrost. Then the control automatically returns to normal and the refrigerator resumes regular refrigerating cycles.

Semi-Automatic Fast Freeze—This is practically the reverse of semi-automatic defrost. After the control has been manually set, refrigeration continues until the evaporator reaches the predetermined low temperature required for satisfactory freezing of desserts, and then automatically returns to normal and the refrigeration resumes regular refrigerating cycles.

The introduction of the semi-automatic, so called "trick" features outlined above, at first involved many complicated and delicate mechanisms. Further complications developed on account of the fragility of the moulded cases and bases used in control construction.

The Rancostat model, introduced for the 1935 production season, has a stainless steel case and was so designed that all the desirable modern control features are neatly arranged within a compact case of non-rusting material.

The OCTOBER 23 issue
of the News will feature
**INSTALLATION and
SERVICE TOOLS**

Every year manufacturers put on the market more and more electric refrigerators. More refrigerators to be installed. More refrigerators to be serviced. The field for jobbers of tools and supplies with which to do the job is expanding rapidly. And the jobbing companies are growing rapidly. Jobbers and service men everywhere want to know more about these products. Distributors and dealers, too, will be interested. If you make installation and service tools or equipment get your advertising copy ready now for this issue. Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.



ANSUL CHEMICAL COMPANY
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Instructions for Adjustment of M-H Refrigeration Controls

THE three kinds of controls for refrigeration systems designed by Minneapolis-Honeywell Regulator Co. (air switch, refrigeration temperature control, and refrigeration pressure control) are all constructed for ready adjustment in the field by the service engineer, and the following instructions outline the steps to be taken in making any necessary adjustments. The Airswitch

is designed to maintain uniform air temperatures in walk-in coolers, refrigerated rooms, florist cabinets, etc., and consists of a bimetallic spiral element, a mercury switch assembly, and an enclosing case.

A pointer is connected to the switch tilting mechanism and may be set for any temperature on the scale. A simple means for widening the operating differential is provided. The pointer may be locked in position at any point on the scale to prevent its being tampered with.

Mounting lugs are provided on the base and a terminal board is arranged for wiring connections. The base is adapted to receive either BX cable or conduit wiring.

In operation, air currents coming in contact with the bimetallic spiral element cause the element to wind or unwind according to temperature changes of the air. This movement is transmitted to the mercury switch assembly, which at a pre-determined setting of the pointer tips the switch to the "on" position on temperature rise and breaks the circuit when the temperature drops.

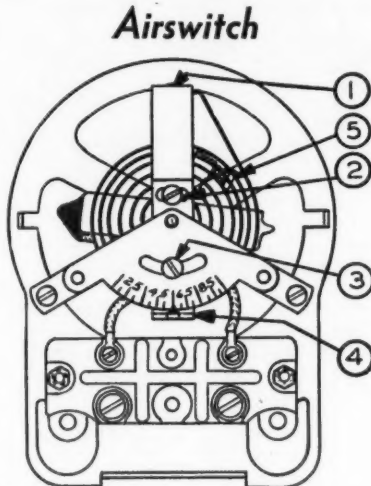


Fig. 1—Drawing showing parts of Airswitch.

Differential Adjustment

The differential or difference between cut-out and cut-in temperatures is adjustable by means of the differential adjusting screw 5, Fig. 1. As the control comes from the factory, it is set for the minimum differential. If the characteristics of the installation are such that the machine starts and stops too frequently, the adjusting screw 5 should be turned to the left as required.

Locking Device

The pointer 4, Fig. 1, is held in position on the scale plate by locking screw 3. To reset pointer, loosen screw 3, reset pointer 4 on scale, then tighten screw 3. If it is desired to prevent tampering of the device by unauthorized persons, a standard wire with lead seal may be threaded through the cover screws to lock cover in position.

Calibration

With pointer 4, Fig. 1, set to the desired degree on the scale plate, the device under control will be stopped at approximately the indicated temperature. The circulating air around the Airswitch is seldom identical on every installation, and, as a result, the scale can be only approximate for the corresponding temperatures.

If a satisfactory temperature is not maintained it can usually be brought about by setting the pointer 4 either higher or lower. However, should it become necessary to recalibrate the instrument, the following method should be used:

1. Remove cover and loosen locking screw 3, Fig. 1, then allow 15 minutes for instrument to cool down to temperature of cabinet or room in which it is located.
2. Move pointer 4 to right until circuit opens.
3. Move pointer to left slowly until circuit just closes in mercury switch.
4. Take temperature reading of room with a standard thermometer.
5. Hold element mounting bar 1 (see Fig. 1) rigid and loosen adjusting screw 2 about one turn.
6. Move pointer 4 to scale position corresponding to thermometer reading. Re-tighten adjusting screw 2.
7. Repeat operations "1" and "2" to check calibration.

Temperature Control

Function of the refrigeration temperature controls are to automatically maintain a constant temperature, by intermittent control of the refrigeration machine, in all types of installations, whether air-temperature jobs or liquid jobs such as water coolers, brine installations, etc.

These controls are thermostats of the bulb and capillary tube or remote type. The control box houses the operating mechanism, consisting of a wide main lever, provided with hardened fulcrum grooves which pivot on widely spaced hardened knife-edged supports. Integral with the main lever is the operating lever, which tilts the mercury switch. The main lever is balanced by a tension main adjustment spring.

The action of the differential adjustment spring, also of tension type, is transmitted to the main lever through a uniquely designed auxiliary lever so positioned as to impose the additional pressure necessary to increase the temperature differential.

The thermostatic element is a self-contained unit consisting of a housed bellows, capillary tube, and bulb. The bellows is provided with suitable limit stops and its housing is attached to

normal position and tilt the mercury switch to an "on" position.

Temperature Adjustment

Main range temperature adjustment or adjustment of the cut-off point is accomplished by turning the large fillister head screw located at the top of the case, see Fig. 2. The pointer attached to the main spring, indicates on the "cut-off point" scale on the side of the case, the temperature at which the instrument will shut down the compressor.

Each division of the cut-off point scale represents approximately 10°. (With exception of 15°-90° range control in which each division represents approximately 20° F.) The top division marked "H" represents the maximum cut-out temperature of the control, and the bottom division marked "L" represents the minimum cut-out temperature. The center division marked "M" indicates the midpoint of the control range and the instrument is factory calibrated at this point. The table below gives approximate values at various scale settings.

Scale Mark	+10° to +50°	-20° to -10°	-50° to -90°	+15° to +90°
H—	40°	20°	10°	90°
M—	30°	0°	-30°	55°
L—	20°	-10°	-40°	35°
	10°	-20°	-50°	15°

It is important to bear in mind that scales indicate bulb temperature. Scales will indicate mean box temperature only when bulb is so located to record mean box temperature.

The mid-scale calibration is made at approximately 900 feet altitude. As the altitude is increased the temperature of the cut-out point is decreased relatively. A correction factor of approximately 1° per 1,000 feet altitude rise must be made.

Example: With pointer at M on 10° to 50°, instrument altitude 900 feet, cut-out temperature 30° F. Control at 5,000 feet altitude, pointer must be set at approximately 35° on scale to obtain 30° F. cut-out temperature at the bulb.

After instrument is installed place a thermometer in the refrigerated space at the location where specific temperatures are desired and turn main adjusting screw until pointer on "cut-off point" scale indicates the temperature at which compressor should stop. Start machine and when it is cut out by control, check thermometer and make further adjustments if necessary.

Differential Adjustment

The differential adjustment or adjustment of the "cut-in" point is accomplished by turning the smaller fillister head screw located at the top of the case. See Fig. 2.

The minimum differential, that is, difference in temperature between "cut-off" and "cut-in," of the instrument is approximately 2½° F. For instance, if the control is set to cut-off at 30° F. and the differential adjustment pointer is set at division "A" or below, the control will cut in again at 32½° F.

Like the main range scale, the differential scale employs an arbitrary alphabetical marking for indication and reference purpose, and the value of each division is approximately 2° F. The action of the differential mechanism is entirely independent of the cut-off point, and the total amount of differential is effective above the cut-out temperature.

If differential is set at minimum, compressor will start at temperature 2½° above that at which it stopped. If it is desired to increase differential, turn differential screw to right, to desired value indicated by pointer.

Example: cut-out point 30° F., cut-in point 38° F. Set cut-out pointer at "M," set differential pointer at "E" on scale. Minimum differential 2½° F., each scale division 2° F. additional. Point "E" being approximately equivalent to 6° F. would give a total of approximately 8½° rise for cut-in point.

See that switch leads are adjusted so that they do not touch each other or any of the working parts.

Pressure Control

Refrigeration pressure controls automatically regulate the operation of refrigeration compressors from the "low side" or suction pressure. These controls cannot be used on ammonia machines; their application is limited to sulphur dioxide, methyl chloride, and Freon equipment only.

These pressure controls are constructed around the same simple and rugged operating mechanism used in the refrigeration temperature controls. The wide main operating lever ruggedly supported on hardened knife edges, through its linkage tilts the same Ceramic Type Heavy Duty Mercury Switch to an "on" and "off" position with a rise or fall of suction line pressure.

Both main range and differential adjustment springs are of tension type, and the unique design of the differential mechanism permits the imposition of auxiliary pressure on the main lever necessary to increase the pressure differential.

The pressure element is a self-

Control Hookup

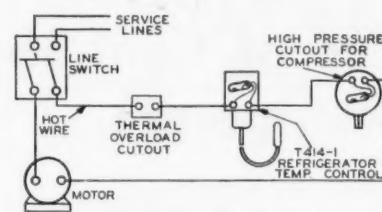


Fig. 3—Hookup showing T 414-1 refrigerator temperature control used as direct control on single phase work.

contained unit consisting of a bellows, spring, housing, and small parts for transmitting bellows movement to the main operating lever.

Both main range pressure adjustment and differential adjustment are accomplished by turning the cross-drilled screws located at the top of the case, the cross-drilled holes affording the means for securely locking the adjustments.

Both adjustments are provided with pointers which indicate adjustment settings on the scale plate mounted on the side of the control case.

Operation

The pressure element of the control is connected to the suction or low side line of the installation. As the pressure rises, the bellows expands, transmitting its movement to the main lever, which in turn tilts the mercury switch to an "on" position. As the pressure drops the main range spring exerts its pull on the main lever, to tilt the switch to an "off" position.

The cut-out pressures are constant for any particular setting of the main range adjustment. The differential adjustment regulates the difference between the cut-out and cut-in points and is adjustable within the limits shown under the heading "specifications."

The differential mechanism through its lever and spring acts to impose additional load on the main lever, raising the cut-in point to a value proportional to the differential spring tension. The action of the differential mechanism is independent of the cut-off point.

Low Side Pressure Adjustment

Main range pressure adjustment or adjustment of the cut-out point is effected by turning the large fillister head screw located at the top of the case, see Fig. 2. The pointer attached

to the main spring indicates on the cut-out point scale, on the side of the case, the pressure at which the control will shut down the compressor.

Low side pressure range is from 22 in. of vacuum to 35 lbs. pressure. The top scale division, marked "H," indicates the maximum pressure and is approximately 35 lbs. per sq. in. The scale division marked "O," indicates zero pressure, and is the point at which the control is factory calibrated. The bottom scale division, marked "L," indicates minimum control pressure and is approximately 22 in. of vacuum.

Approximate values of the intermediate divisions are as follows:

- H—35 lbs. press
- 20 lbs. pressure
- 10 lbs. pressure
- O—0 lbs. pressure
- 10 in. vacuum
- L—22 in. vacuum

Differential Adjustment

The differential adjustment or adjustment of the cut-in point is accomplished by turning the small fillister head screw located at the top of the case, see Fig. 2. The minimum differential, that is, difference between cut-out and cut-in of the instrument is approximately 4 in. of vacuum on the vacuum side, 2 lbs. at "O," and 3 lbs. at "H."

If the control is set to cut off at 10 lbs. and the differential adjustment pointer is set at "A" or below the control will cut in again at approximately 12 lbs. Similar to the main

Pressure Hookup

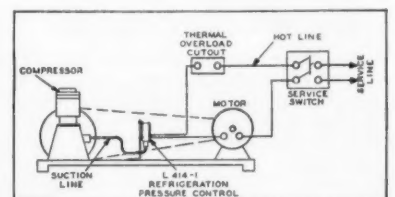


Fig. 4—Hookup showing L-414-1 refrigeration pressure control used as direct control on single phase work.

range scale, the differential scale employs an arbitrary alphabetical marking for indication and reference purpose and the value of each division is approximately 4 lbs.

Action of the differential mechanism is entirely independent of the cut-out point and the total amount of differential is approximately 4 lbs.

(Concluded on Page 21, Column 1)

RANCOSTAT



In appearance, in performance, in durability—

THE ARISTOCRAT of Refrigerator Thermostats

It costs no more to use the best!

Write today for KR Bulletin

THE AUTOMATIC RECLOSING CIRCUIT BREAKER CO., Columbus, Ohio

Temperature Control

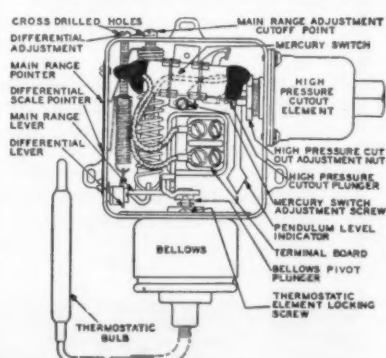


Fig. 2—Sketch of Minneapolis-Honeywell temperature control.

CONTROLS

Operation & Service of Controls For Household Refrigerators

By A. F. Rucks, C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

AN important part of any household refrigerator is the device which controls the temperature. In modern refrigerators this device is a temperature controller—a thermostatically operated electric switch which stops and starts the motor. The tube system is filled with a volatile liquid under pressure, and as the temperature of the evaporator coil changes, the liquid in the

bellow vaporizes or condenses and thus causes the bellow to expand or contract.

This movement through a switch mechanism operates a set of electric contacts that make and break the circuit.

Several years ago temperature controllers, while considerably larger, did not have as many adjustment refinements as the modern instruments. In the older devices there were no handy facilities for readily changing the temperature setting.

If a colder or warmer temperature was desired, it was formerly necessary to remove the controller cover and make an intricate adjustment. This, coupled with the inaccessible location of the control unit, made it almost impossible to change the adjustments, with the result that only one box temperature condition was maintained.

Knob Controls Temperature

Today, however, it is only necessary to turn a knob on the temperature controller, shown in Fig. 1. By means of a graduated dial, varying degrees of fast freezing are obtained easily. The same adjusting knob is used for defrosting, eliminating the necessity of disconnecting the wall plug with the resulting danger of allowing the box temperature to rise above safe limits, in case the plug is not reconnected.

When the temperature adjusting knob is turned to the "defrost" mark on the dial, the operating range of the instrument is raised, permitting the coils to defrost. During this period the controller keeps the unit in operation on a higher temperature cycle, but does not allow the food storage compartment to go beyond the safe temperature required for the preservation of food.

Tests for Control

The refrigerator service engineer should familiarize himself with a few simple rules and tests before attempting to make any adjustment to the control mechanism. In many cases controllers claimed to be defective are returned to the factory and an inspection shows there is nothing wrong but that they were returned by the service man who jumped to the conclusion that the trouble was caused by the instrument.

Many service men who are not sufficiently experienced with the controller mechanism, try to make their own adjustments and often put the

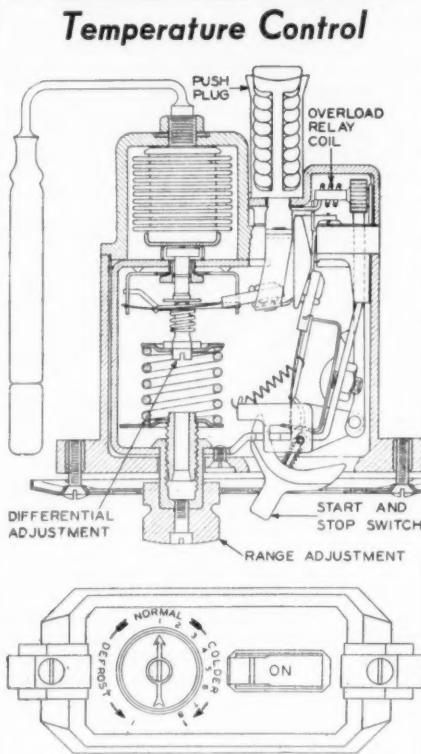


Fig. 1—Tag type R-18 Snapon temperature controller.

instruments in such a condition that they could not possibly perform. Very often, improper operation of the expansion valve makes it appear as though the temperature controller is at fault.

Two Tests for Stopped Control

If a temperature controller has been working satisfactorily, and then suddenly fails to make circuit when the box temperature rises, the trouble can generally be located by doing one of two things:

First, inspect the wiring for a loose connection. The connecting wires are attached to a push plug which fits over prongs projecting from the back of the controller case and the service man should make certain that this plug is securely fastened to the prongs. The second place to look for trouble is in the tube system. Occasionally the tube system develops a leak due to a break in the tubing or an imperfection in a soldered joint. If the contacts of the controller do

not close on a rising temperature, it is safe to assume that a leak in the tube system has occurred and the remedy is to replace the controller with a new one.

To guide the service engineer in his work various instruments are now available. For example the square case dial-indicating thermometer, illustrated in Fig. 2.

Check Thermostat Settings

This instrument measures only 4 in. square and is used effectively to check the thermostat setting as well as to observe the operation of the expansion valve by means of the temperature changes of the evaporator coil.

The dial thermometer is usually placed on top of the refrigerator with its bulb located inside the box, by means of a fine capillary tubing, which connects the instrument proper and bulb. The tubing is small and

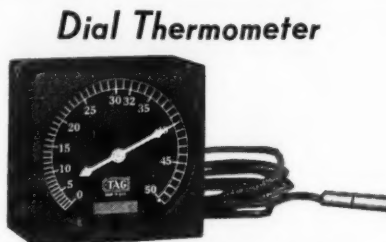


Fig. 2—Dial indicating thermometer

permits the refrigerator door to close tightly on it without causing damage.

With this dial thermometer the service engineer can watch the performance of the unit, and check the evaporator coil or food compartment temperatures without opening the refrigerator door.

Recording Thermometer

Another instrument, known as the miniature size recording thermometer, measures only 6 in. square and is frequently preferred in place of the dial. This instrument records the temperature on a paper chart. It is supplied in two models, one, a regular recording thermometer shown in Fig. 3, and the other a combination instrument which is connected in circuit with the motor, and by means of two pens records running and idling time as well as the temperature of the evaporator coil or food compartment.

Recording thermometers are made

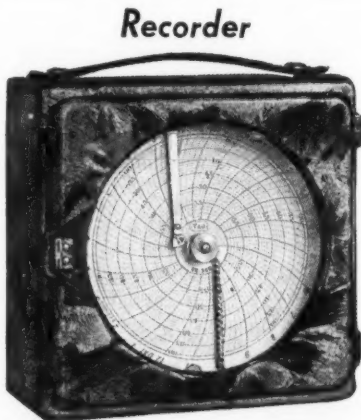


Fig. 3—Recording thermometer.

in the self-contained and distance types. The self-contained type is recommended when it is desirable to place the entire instrument in the food compartment. The distance type permits the bulb to be placed in the food compartment or on the evaporator coil while the instrument is located outside of the box, giving a visible chart record at all times without opening the refrigerator door.

Instruments More Accurate

While more costly than the glass tube pocket thermometer, dial-indicating and recording instruments are easier to read and more accurate to use in checking the evaporator coil temperatures.

In a great many instances, complaints about incorrect food compartment temperatures are nothing more than imaginary, and it is very often possible to convince a housewife that her refrigerator is maintaining the correct temperature by showing her a temperature record made by a recording thermometer as actual proof.

By the application of modern developments instrument manufacturers have incorporated in the temperature controller a protective device usually called an overload relay, shown in Fig. 1. The function of this unit is to break the circuit and stop the motor whenever an overloaded condition occurs.

Action of Overload Relay

When the overload relay trips, the toggle switch is thrown to the "off" position and the unit cannot refrigerate until the overload has been removed, after which it is again possible to reset the relay.

If the overload continues to exist, the overload relay will again trip and should this performance be repeated a number of times a service man should be called.

The toggle switch arrangement

Control with High Temperature Cut-out

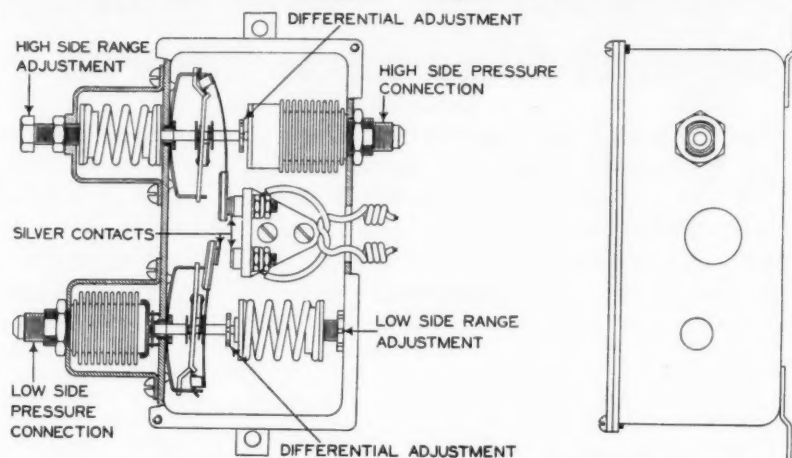


Fig. 4—Temperature controller with high temperature cut-out.

illustrated in Fig. 1 is only one type; other controller models employ a push pull knob. When the overload relay trips, the push pull knob is thrown out and a red sector on the stem of the knob makes an appearance, indicating that the circuit is broken.

The overload relay consists of a heating coil surrounding a stem to which a ratchet is held in place by means of solder. The ratchet is in turn connected to the tripping mechanism. When current is passed through the coil, the stem becomes warm due to heat radiation from the heating coil.

Solder Melted by Heat

Should a condition arise where an overload is placed on the motor the heating coil becomes hot enough to soften the solder, permitting the ratchet wheel to turn, thus disengaging the lever mechanism and allowing the contacts to break the circuit. The heating coils are tagged with a rating based upon Underwriters' requirements as outlined in Underwriters' Laboratories Standard for industrial controller equipment.

The service engineer is frequently confronted with the problem of obtaining a replacement temperature controller. Often, exactly the same instrument that he found on the refrigerator cannot be secured.

Sometimes the connecting tubing length may vary or the temperature setting may be different.

In some cases the replacement operates at too high or too low a temperature, which can be reset easily by the outside adjusting knob, or by shifting the bulb to another coil, and coiling excess tubing into a spiral behind the evaporator shield.

Pressure Controls

In commercial installations, such as display cases, ice cream cabinets, butcher boxes, coolers, and storage compartments a great many refrigerating machines are used. Some of these installations use pressure controllers while others use temperature instruments.

Where fairly large storage rooms are being cooled, temperature controllers are very often installed with the bulb located within the room itself. Care should be exercised in locating the bulb so that material is not piled around it, interfering with the air circulation.

If the controller bulb is located in a dead air pocket, the instrument will not maintain a uniform temperature throughout the room.

In installations where a blower is used, it is advisable to place the bulb near the blower so that the controller will regulate the temperature of air being circulated in the room.

The service engineer should endeavor to familiarize himself with the

construction of pressure and temperature controllers used on commercial refrigerating machines. The instruments in general are very simple in their construction and the adjustments, while not as readily accessible as controllers used on household refrigerators, are easy to make.

On water-cooled units a water-circulating valve regulates the flow of condensing water. On units of this type, a double controller is usually used.

This instrument, illustrated by Fig. 4, has a high-pressure cut-out attachment that breaks the circuit in the event that the condensing pressure continues to rise beyond the capacity of the water-circulating valve.

Mercoid Adds Outside Adjustment to Controls

CHICAGO—Mercoid Corp. has introduced a new double outside adjustment feature to its line of pressure and temperature refrigeration controls.

The adjustment is made on the outside and is provided with a locking device to prevent tampering. Advantage of this adjustment, claim Mercoid officials, is in the manner in which the low and high operating setting may be quickly determined by means of a calibrated dial which is in plain view.

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New Overload Assembly

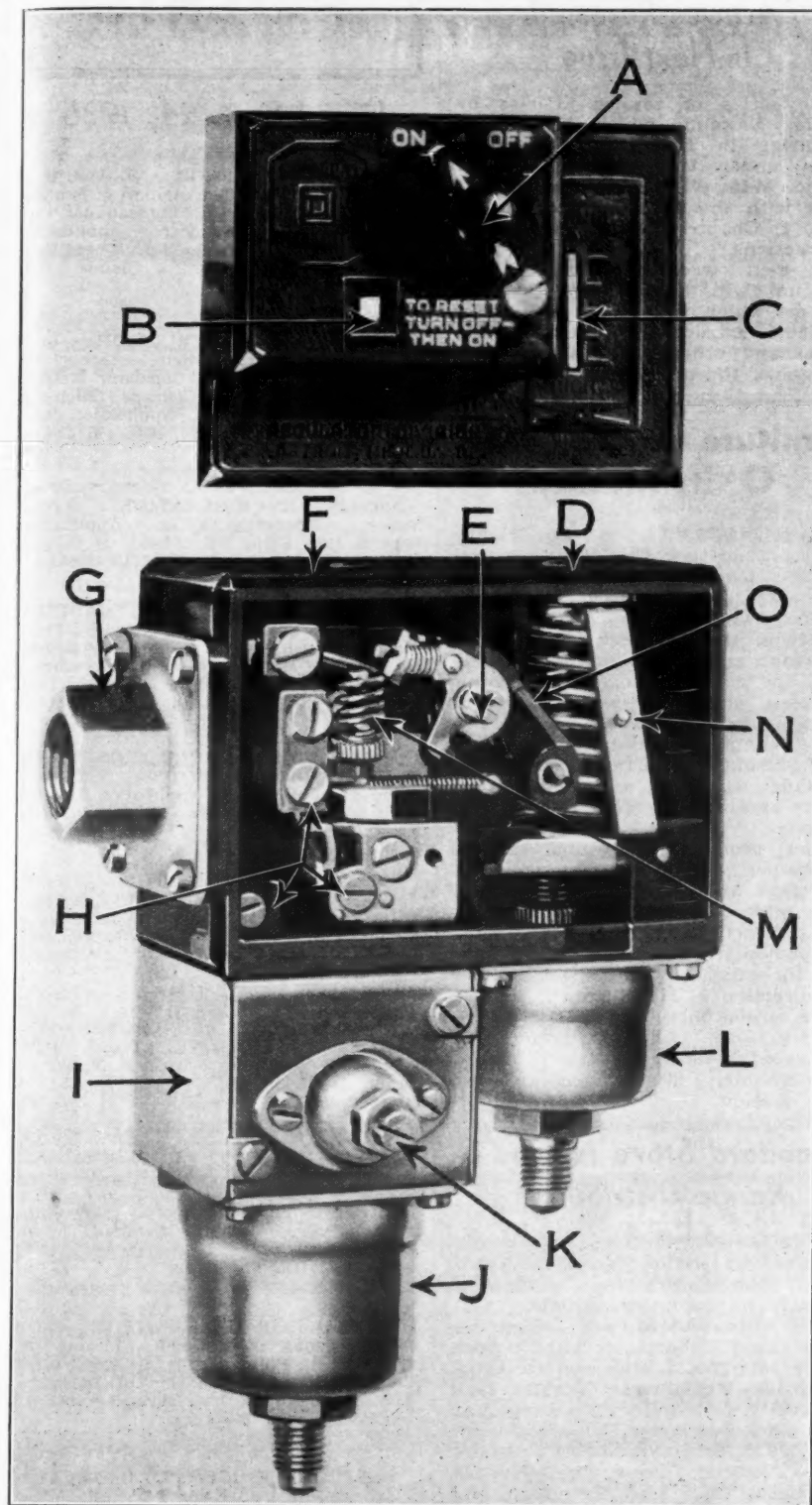


Fig. 1—Square D overload assembly for commercial refrigeration equipment is shown in detail above. A—Manual "on and off" and reset. B—Overload trip indicator. C—Range indicating pin slot. D—Range adjustment. E—Manual "on and off" reset stud. F—Differential adjustment. G—Steel conduit flange. H—Terminal screws for wiring. I—High Pressure Cut-out inside range adjustment. J—High pressure cut-out. K—High pressure cut-out locked differential adjustment. L—Low side bellows housing. M—Heater coil and solder pot. N—Range indicating pin. O—Overload block assembly.

How to Adjust M-H Pressure Controls

(Concluded from Page 19, Column 5)
ential is effective above the cut-out pressure.

To Set Control

Pressure Adjustment. By means of main adjustment screw, set pointer on cut-out point scale to pressure it is desired the machine should stop. Start machine and check cut-out point pressure with low side gauge and make further adjustment if necessary.

Differential Adjustment. If differential is set at minimum or point "A," compressor will start at a pressure approximately 2 lbs. above that at which it stopped. To increase differential turn differential screw to right to desired point indicated by pointer.

Example: Cut-out point 5 lbs. Cut-in point 25 lbs. Set cut-out pointer at point midway between "O" and next scale division, on main range scale. Set differential pointer half way between divisions "E" and "F" on differential scale. Minimum differential 2 lbs. each scale division approximately 4 lbs. additional. Point between "E" and "F" being approximately equivalent to 18 lbs. would give a total differential of approximately 20 lbs. rise for cut-in point.

High Pressure Cut-Out Adjustment. If it is desired to lower cut-out point on lowest and intermediate ranges, screw out high pressure cut-out adjusting nut until desired cut-out pressure is obtained as indicated by high side gauge, see Fig. 2. To increase cut-out point on highest range, screw in on high pressure cut-out adjusting screw. The differential between cut-in and cut-out on this element is not adjustable.

To Replace Mercury Switch

If it ever becomes necessary to

replace the mercury switch in the field, use the following instructions as a guide and avoid trouble:

1. Note carefully the switch position and lead arrangement before taking out the old switch so that new switch can be similarly placed.

2. Open the line switch. Do not work on the circuit without cutting off the power.

3. Cut the seal wire holding the switch clip prongs.

4. If mercury switch is wrapped with friction tape it may now be taken from the clip. If the switch is sealed in with ambroid (brown lacquer cement) insert the point of a knife between the switch and each clip prong and pry gently until cement crackles and loosens its hold on the switch. The leads may then be disconnected and the switch easily removed.

5. Wrap one or two layers of friction tape around the new switch at the point where the clip grips it. If the old switch was similarly wrapped with the tape holding the leads, arrange the leads of the new switch in the same manner. The new switch may now be placed in the clip, taking care that it is well centered.

6. In the following manner, check the mercury switch to see that its travel is equally divided on each side of a vertical center line. By hand, tilt the mercury switch between its limit stops and make sure that the mercury comes around the electrodes in each end of the tube to the same height. Mercury switches with electrodes in one end may be checked in a similar manner except that the level of the mercury may be checked by sight in the end of the switch without electrodes. By slightly turning the mercury switch stop adjusting screw, Fig. 1, the angular travel of the mercury switch may be divided on each side of center and correct action of the circuits obtained.

7. Recalibrate the control as described under heading "to check calibration or to recalibrate."

Square D Develops Overload Assembly

(Concluded from Page 1, Column 3)
manual on-and-off by means of a button in the front cover. Reset after an overload trip is made by the same means.

The overload device is trip-free and indicating. The reset button cannot be blocked or tied in to prevent an overload trip. When the device trips due to an overload, this opening of the circuit is indicated in the cover of the regulator.

The bakelite overload block is heat resisting and as a complete unit is held in position to the standard regulator body by two accessible screws. All parts of the overload device, as well as the switch mechanism, are entirely enclosed by the brown bakelite case and cover.

All features of the Square D controls with overload protection are expressed in the 9100 type BPK3 shown in Fig. 1. This device offers high and low side automatic control. Both range and differential adjustments are indicating. Screw driver adjustment is shown, but knobs can be furnished if specified. A steel flange threaded $\frac{1}{2}$ in. provides conduit wiring.

The overload feature in the upper left-hand corner of the regulator. The differential adjustment of the high pressure cut-out is locked and its range adjustment is accessible only by the removal of its cover.

A permanent magnet is used to provide quick make and quick break for low side operation, while the over-center spring incorporated in the high pressure cut-out, provides snap action for the same set of contacts. A steel strap screwed to the back of the regulator case provides a means of mounting.

Type BP3 provides high and low side pressure control, but is without overload protection. Type BT3 is arranged for temperature control with high pressure cut-out and is without the overload feature. Type BTK3 provides temperature control on the low side, high pressure cut-out, and includes overload protection.

Type APK4 is arranged for low side pressure control without high pressure cut-out, has adjusting knobs for range and differential, and is without overload protection. Either end or bottom conduit flange may be specified. Type AP4 is a pressure regulator without high pressure cut-out, with adjusting knob, without overload protection, and with either end or bottom conduit available.

These devices, representing a part of the new line, are built around the standard 9100 regulator as a base, permitting the addition or omission of the various features listed.

The Square D Co. introduced "unified control" several years ago to pump manufacturers, and now offer a "unified control" for commercial refrigeration consisting of the proper motor starter and necessary automatic temperature or pressure control housed and wired in one steel enclosure. Fig. 2 shows a class 8532 motor starter housed with a type BP4 regulator, ready for compressor mounting.

The Square D Co. operates major factories at Detroit, Milwaukee, Los Angeles, and Toronto, Ontario, Can., as well as a porcelain and bakelite plant at Peru, Ind.

With Motor Starter

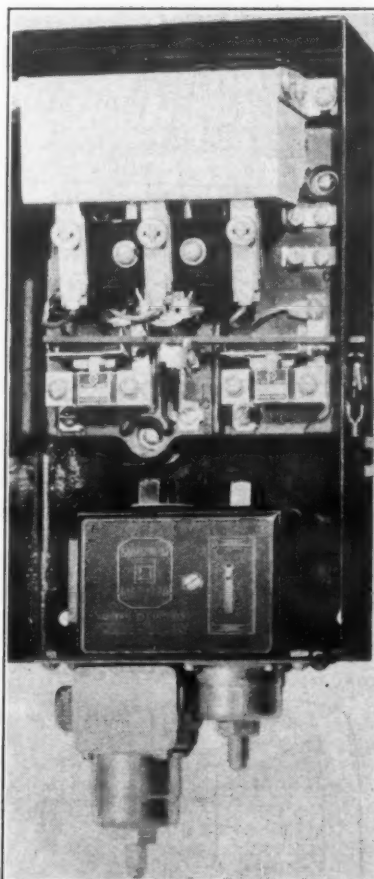
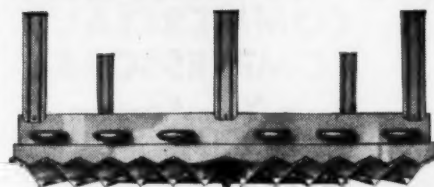


Fig. 2—Class 8532 Square D motor starter housed in cabinet with BP4 regulator.

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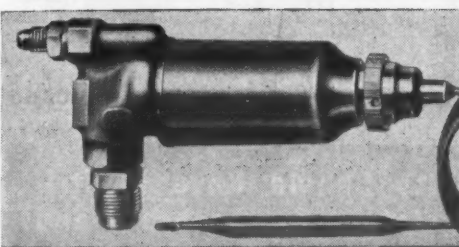
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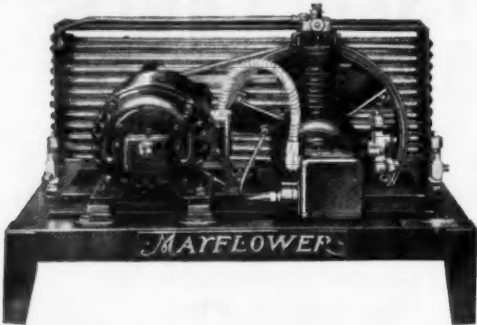
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MANUFACTURERS SPECIALIZING IN SERVICE
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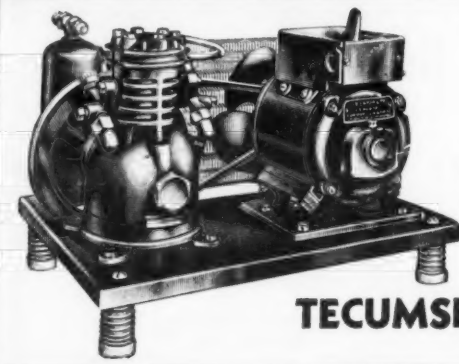
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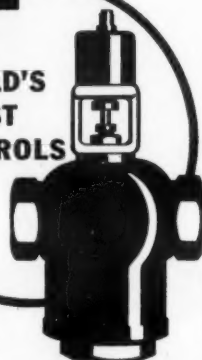
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A preview of new developments which will be available in
1936 models will make this issue unusually attractive to all
sections of the industry. If you have accessories to sell,
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Siegel-Spreen Puts 'Umidostat' Control Device on Market

DETROIT—"Umidostat," a device
for controlling humidity directly on
humidification or dehumidification ap-
paratus of all types, has recently
been put on the market by the Siegel-
Spreen Co. of this city.

This new control is featured by the
high current capacity of the switch;
it will control a 1/2-hp. motor directly
without a relay.

According to the manufacturer, the
device will maintain relative humidities
up to within two per cent plus
or minus of the desired setting.

The hygroscopic primary element
movement caused by the changes in
relative humidity transmits motion
direct without levers to an electric
switch.

This hygroscopic primary element
is a fine grain wood cone disc so
shaped as to give a maximum exposed
working surface to the medullary
wood fibres and veins, which are
about the same length in two direc-
tions. With this design the constant
elongation and contraction movements
of the element do not break or warp
the wood fibres, its makers claim.

An indicating pointer makes pos-
sible settings for any desired relative
humidity. A safety tension release
protects the element from excessive
humidities or overloading.

The electric switch is in an insu-
lated, compact, sealed, dustproof case.
The switch has large silver contacts,
high overload capacity, lock contact
resistance, high current capacity with
positive snap action.

Electrical rating characteristic of
the switch permits direct control and
will safely make and break 10 am-
peres at 100 volts a. c., 5 amperes at
220 volts a. c., 1/2 ampere at 440 volts
a. c., 1/2-hp. motor, 110 or 220 volts
a. c. On normally open contacts, motor
starting current should generally be
limited to 20 amperes.

Overload capacity is said to be such
that in an emergency the micro
switch will carry indefinitely a cur-
rent of 30 amperes—the full stalled
rotor current of 1/2-hp. motor, and
break the circuit safely if called up-
on to do so.

Overall dimensions are 3 3/4 inches
in diameter, and height, 2 1/4 inches.

WLW & WSAI Building Auxiliary Studio

CINCINNATI—Auxiliary broadcast-
ing studios for stations WLW and
WSAI are being constructed in the
Union Central Annex, announces
President Powel Crosley, Jr., of Cros-
ley Radio Corp. These studios will
supplement those at the main plant
on Arlington St.

Building of the new studios is in
line with what might be termed
normal expansion, Mr. Crosley states.
At the time the main studios were
built most programs were one hour
shows. More recently has come the
tendency toward 15-minute programs,
which necessitates more rehearsals
and far more studio facilities in order
to maintain the 19 1/2-hour daily
schedule.

Master Service Manual Articles Resumed In Next Issue

The series of service articles by
K. M. Newcum which have been
appearing in ELECTRIC REFRIGERATION
News under the heading "Master
Service Manual" will be resumed next
week with the publication of Instal-
ment 1, Chapter 9 "General Service
Instructions."

In next week's instalment Mr.
Newcum will outline the types of
systems which will be covered under
service instructions, identify the
valves and other parts, and explain
the use of the combination gauge set.

Furniture Co. Sells 11% Of Its Market

MARTINSVILLE, Va.—Henry
County Furniture Co., local General
Electric dealer, has sold electric re-
frigerators to more than 11 per cent
of the owners of domestic electric
meters in this territory. During the
first four and a half months of this
year, the company sold 30 refrigera-
tors, as compared with a yearly
average of 30 in years previous.

The company maintains one full-
time outside refrigerator and electric
appliance salesman, and all members
of the organization sell electric appli-
ances.

Sales promotion mediums include
newspaper, direct mail, outdoor ad-
vertising, and the distributor's G-E
sales pilot coach, which takes appli-
ances direct to the prospect's home
for demonstration purposes.

A three-day cooking school, under
the direction of Mary Brown Allgood,
home service director for R. S. Mont-
gomery, Inc., G-E distributor, was
conducted recently by the company.
Approximately 200 women attended
each session.

Standard Stove Names 6 Range Distributors

TOLEDO—Appointment of six dis-
tributors to handle Standard Electric
Stove Co. products was announced
recently by company officials.

New distributors are: Houston-
Starr Co., Pittsburgh, to handle west-
ern Pennsylvania and eastern Ohio;
Bushwick-McPhibben Corp., New
York City, to handle the metropolitan
New York City area; Farwell, Ozmun,
Kirk & Co., St. Paul; Gilbert Brothers,
Inc., Portland, Ore.; The Geo. H.
Eberhard Co., San Francisco, for
northern California; The Hardware
& Supply Co., Akron, Ohio, for
central Ohio.

Crosley Given as Prize in Subscription Contest

GAHANNA, Ohio—A Crosley model
FA-50 Shelvador electric refrigerator
was offered as first prize in a sub-
scription contest conducted here re-
cently by the Tri-Community News,
weekly newspaper. The contest, which
closed Sept. 14, exceeded all past con-
tests in public interest, F. A. Pegler,
editor and publisher, said.

PATENTS

Issued Sept. 24, 1935

2,015,124. COMPRESSOR AND VACUUM
PUMP. Cesar Pfeiffer, Asnieres, France,
assignor to Fuller Co., Catasauqua, Pa.,
a corporation of Delaware. Application
March 1, 1934. Serial No. 713,468. In
France March 16, 1933. 3 Claims. (Cl.
230-153.)

2,015,126. VALVE STRUCTURE. John
R. Replogle, Detroit, Mich., assignor, by
mesne assignments, to Copeland Refrig-
eration Corp., Mount Clemens, Mich., a
corporation of Michigan. Application June
9, 1932. Serial No. 616,274. 1 Claim.
(Cl. 230-221.)

2,015,168. REFRIGERATION. Gordon
Varney, Bradenton, Fla. Application
Sept. 5, 1931. Serial No. 561,457. 14 Claims.
(Cl. 62-104.)

2,015,292. REFRIGERATOR CABINET
SUPPORT. Sylvester M. Schweller, Day-
ton, Ohio, assignor, by mesne assignments,
to General Motors Corp., a corporation
of Delaware. Application Jan. 28, 1933.
Serial No. 654,049. 2 Claims. (Cl. 311-109.)

2,015,307. ROTARY PUMP, COMPRES-
SOR, OR DRIVEN MOTOR. James M.
Hand, Shubuta, Miss. Application Jan. 17,
1933. Serial No. 652,222. 20 Claims. (Cl.
103-137.)

2,015,389. REFRIGERATOR SHELF.
John B. Whitted, Evanston, Ill., assignor
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corporation of Virginia. Application Dec.
18, 1933. Serial No. 702,879. 10 Claims.
(Cl. 211-153.)

2,015,411. MONEY COLLECTOR FOR
AUTOMATIC REFRIGERATORS, ETC.
Herbert E. Riley, New York, N. Y. Appli-
cation Dec. 11, 1931. Serial No. 580,308.
10 Claims. (Cl. 194-6.)

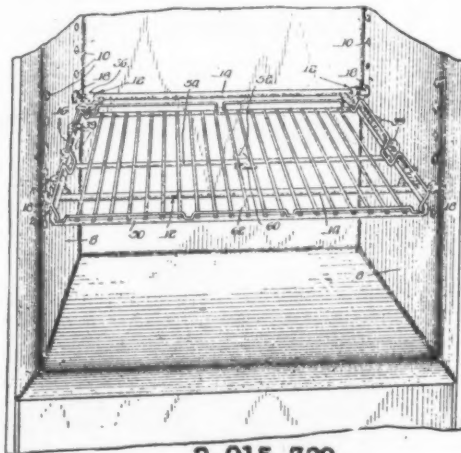
2,015,466. ICE TRAY MECHANISM.
Jens Touborg and Aage M. Jacobsen,
Greenville, Mich., assignors to Gibson
Electric Refrigerator Corp., Greenville,
Mich., a corporation of Michigan. Appli-
cation April 5, 1935. Serial No. 14,900.
6 Claims. (Cl. 62-108.5.)

2,015,489. AIR CONDITIONING FOR
CARS. Frank O. Marshall, Chicago, Ill.,
assignor to Pullman Car & Mfg. Corp.,
Chicago, Ill., a corporation of Delaware.
Application Nov. 9, 1932. Serial No. 641,823.
7 Claims. (Cl. 62-139.)

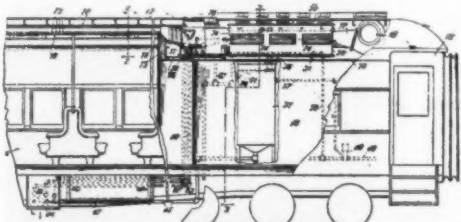
2,015,515. REFRIGERATING APPARA-
TUS. Gordon M. Evans, Detroit, Mich.,
assignor to Kelvinator Corp., Detroit,
Mich., a corporation of Michigan. Appli-
cation Oct. 26, 1933. Serial No. 695,233.
1 Claim. (Cl. 286-11.)

Mullins Sues Two Firms On Evaporator Patents

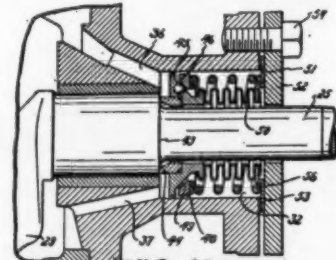
CHICAGO—Mullins Mfg. Co. has
filed suit in the United States District
Court, Northern District of Illinois,
Eastern Division, against General
Household Utilities Co. and Oakes
Products Corp., claiming infringement
of patent No. 1,669,918, and re-issue
patents Nos. 18,182 and 19,136.



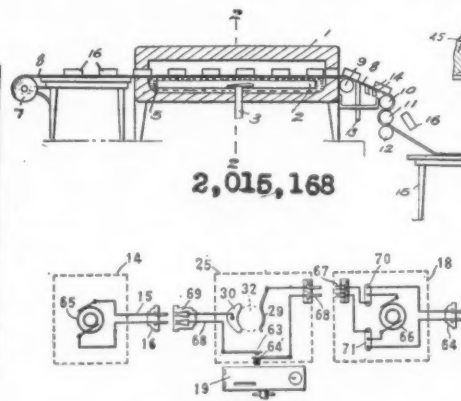
2,015,389



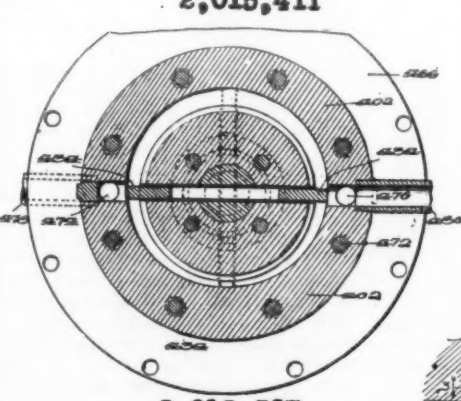
2,015,489



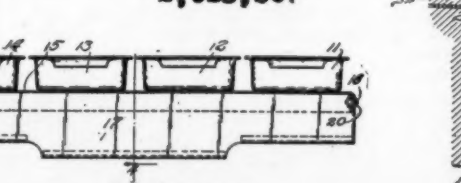
2,015,515



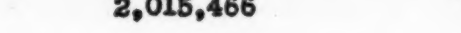
2,015,168



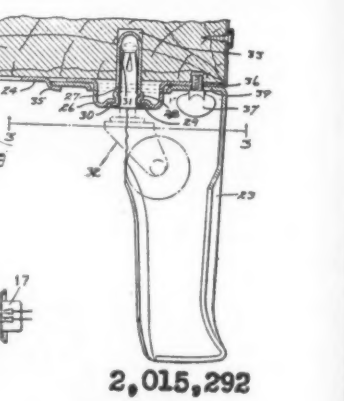
2,015,411



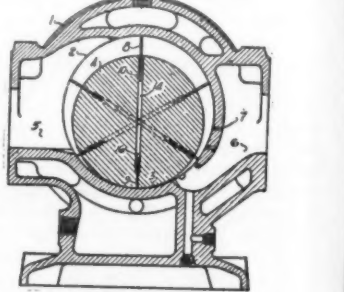
2,015,307



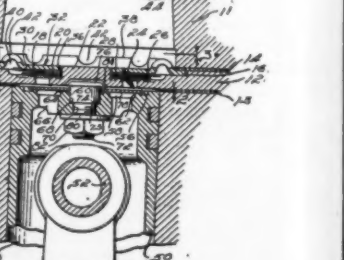
2,015,466



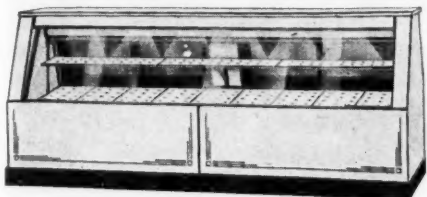
2,015,292



2,015,124



2,015,126

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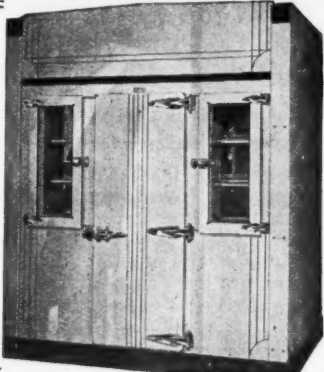
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This issue will place editorial emphasis on new developments in evaporators for both household and commercial purposes. Ice cube trays and other cooling unit accessories will also be given special attention. To manufacturers of these products: the Oct. 30 issue offers an opportunity to present your sales arguments in an editorial environment which will command the attention of your customers and prospects. Reserve your space now.

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(Please indicate products sold or principal line of business.) 10-9-35

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☐ Enclosed find remittance. (See rates above.)

Name
Attention or In care of
Street Address City and State
We sell the refrigerator and
(Please indicate other products or principal line of business.) 10-9-35

QUESTIONS

Sales by Public Utilities

No. 2502 (Manufacturer, Michigan)—"What percentage of the total number of electric refrigerator sales are made by the merchandising departments of public utility companies?"

Answer: The 1934 REFRIGERATION AND AIR CONDITIONING DIRECTORY AND MARKET DATA BOOK, upon the basis of a survey of distribution outlets at that time, estimated that public utility companies made 14.6 of all household electric refrigerator sales. We do not have a more recent estimate.

Breakdown of Sales

No. 2503 (Dealer, New York)—"I have had occasion, recently, to study the excellent matter presented in your current publication '1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA' and should like to inquire whether you have prepared similar information in whole or in part covering the Borough of Queens, New York City."

Answer: We have no further breakdown of the figures than those published in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK. All statistical and market data on the refrigeration and air conditioning industry that was available was published in this book.

Devon Co. Address

No. 2504 (Manufacturer's Agent, New York)—"In the Sept. 4 issue of ELECTRIC REFRIGERATION NEWS, under the patent column, we notice that Mr. M. J. Ajam, of Waltham, Mass. has received a patent on a refrigeration machine and assigned said patent to the Devon Manufacturing Co., Boston, Mass."

"We would greatly appreciate your advice as to the street address of this company."

Answer: 75 Federal St., Boston, Mass.

State Sales Figures

No. 2505 (Distributor, Pennsylvania)—"We are interested in receiving the copy or copies of ELECTRIC REFRIGERATION NEWS wherein the total refrigeration sales figure was shown for the years 1933 and 1934 for the states of Pennsylvania, New Jersey, Delaware, and Eastern Shore Counties of Maryland and Virginia."

"In the event this cannot be supplied in issues of the NEWS we will appreciate this information in month by month form for the years and territory quoted."

"Also we should like this same information by month, for the same territory, for the year 1935 to present date."

Answer: Sales figures for all years through 1934 are published in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK.

The sales figures represent sales of household electric refrigerators by manufacturers to distributors, and are broken down by states, but not by counties. However, the DATA BOOK gives wired homes figures for each county, from which an estimate may be made of their share of the total sales made in the state.

Monthly sales reports on the same basis have been published in issues of ELECTRIC REFRIGERATION NEWS throughout this year, and the following are the issues giving the sales by states for each month.

January sales by states—March 13 issue; February—May 1 issue; March—May 22 issue; April—June 5 issue; May—July 17 issue; and July—Sept. 11 issue.

As the June figures for sales by states were not published in ELECTRIC REFRIGERATION NEWS, following are the figures for the states in which you are interested:

Pennsylvania, 11,454; New Jersey, 7,180; Delaware, 308; Maryland, 2,255; Virginia, 2,094.

Address of Nema

No. 2506 (Publishing House, Illinois)—"Will you please advise me as to the address of the headquarters of the National Electrical Manufacturers Association?"

Answer: 155 East 44th St., New York City.

Air-Conditioning Jobs

No. 2507 (Engineering Company, New Jersey)—"Do you have a list or record of air conditioning installations in this section of the country, including the New England States, also New York, New Jersey, Delaware, Maryland, Pennsylvania, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, New Orleans, Mississippi, and Ohio?"

Answer: We do not have a list of the air conditioning installations, giving the addresses of such installations, for the territories which you list. A summary of the air conditioning installations in some 30 major cities throughout the country, by type

of establishment, is published in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK.

It might be possible to obtain complete records of the air conditioning installations made in the territories which you mention by contacting the power companies that serve those territories.

Data on Refrigerants

No. 2508 (Manufacturers' Branch Office, Oregon)—"Do you know of a text book that is published applying to the installation, operation, and figuring out the requirements necessary in working out the application of methyl chloride and Freon refrigeration, a text book similar to those put out on ammonia refrigeration?"

"If there is such a text book, would you be kind enough to advise us who issues it?"

Answer: We believe that the Refrigerating Data Book published by the American Society of Refrigerating Engineers, 37 West 39th St., New York, N. Y., would be of help in working out these problems.

The series of articles by K. M. Newcum in the weekly issues of ELECTRIC REFRIGERATION NEWS, which articles with other supplementary material, will be published in book form as the MASTER SERVICE MANUAL, might also be of assistance to you.

Refrigerator Sales

No. 2509 (Government Department, District of Columbia)—"In connection with a study I am making, I would appreciate any information you are able to give me as to the growth in number of mechanical refrigerators in use in the United States."

Answer: The growth in number of mechanical refrigerators in use in the United States can best be determined by consulting statistics on sales of refrigerators as published in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK which contains all available industry statistics. Figures on the total sales of refrigerators in the United States by months, together with monthly sales by states, from 1930 through the end of 1934, are given in the DATA BOOK, as well as total sales by all United States manufacturers from 1920 through 1934, by years.

Monthly reports of manufacturers' sales of household and commercial refrigeration equipment are published in ELECTRIC REFRIGERATION NEWS each month as soon as the figures are released by the National Electrical Manufacturers Association, at which time ELECTRIC REFRIGERATION NEWS also makes its estimate of total sales made by all the manufacturers in the industry.

Ambisco Ware

No. 2510 (Manufacturer, Wisconsin)—"We are trying to locate the complete address of the factory making Ambisco ware."

"This ware is sort of an earthenware. These people make a little round food container suitable for use in a food file and we, therefore, are anxious to get in touch with them."

"If you have any record of the manufacturer of Ambisco ware, won't you please advise us at your earliest convenience so we can get in touch with them."

Answer: Ambisco ware is manufactured by the American Bisque Co., Inc., Williamstown, W. Va.

Nema Storage Capacity

No. 2511 (Distributor, Ohio)—"Is the Nema standard method for computing gross and net cubic foot contents of household refrigerators as published in your 1934 REFRIGERATION DIRECTORY still in effect. Please advise any revision which may have been since made in recommended method."

Answer: Standards adopted in May, 1931, are still in effect.

Replacement Parts

No. 2512 (Parts Jobber, Louisiana)—"Will you please send to us the 1935 REFRIGERATION DIRECTORY AND MARKET DATA BOOK."

"Will you also advise us what companies are manufacturers of replacement parts for Frigidaire, Servel, and other makes of refrigerators."

"We are jobbers doing a wholesale business exclusively. We have noticed that several of the wholesalers putting out mail order catalogues have these parts listed and we have been unable to locate their source of supply."

"Immediate information on this subject will be greatly appreciated."

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We are proud of the part we have played in building the Refrigeration Industry to its present vast proportions by constantly supplying it with men trained to promote its further growth. As the leading school in the refrigeration field we offer our services to both those desiring personal training and the services of trained men.

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